



Digital Audio Mixing System

Operation Manual

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digital emotion

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Manual written by Tim Driedger and Rob Wenig.

Note: *This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

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IMPORTANT SAFETY INSTRUCTIONS



The lighting flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.

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- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

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- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
 - 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
 - 15) **WARNING – TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.**
 - 16) Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
 - 17) To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
 - 18) The mains plug of the power supply cord shall remain readily operable.
 - 19) This unit is provided with a power supply cord set suitable for 120V AC input only (for U.S.A. and Canada). For other than U.S.A. and Canada, a qualified person must provide for use with this unit, an appropriate, approved power supply cord set which is in compliance with the end use country requirements and has a minimum cross-sectional area of 1.0mm².
 - 20) For units with more than one power cord:

Caution: This unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.

Attention: Cet appareil comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher les deux cordons d'alimentation avant de faire le dépannage.

- 21) Operator Accessible Fuse:

Caution: For continued protection against risk of fire, replace only with same type and rating of fuse.

Attention: Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de même caractéristiques nominales.

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Chapter 1: Introduction

Congratulations on your purchase of System 5-B, a high-performance digital mixing console intended for on-air broadcast and live applications. System 5-B has been designed to satisfy broadcast audio professionals who demand the highest quality standards. System 5-B is the perfect choice for serious broadcast audio production facilities that require a powerful digital mixing system with an easy-to-use interface.

1.1 How to Use This Manual

Euphonix has dedicated substantial time and resources to the System 5-B documentation. We recognize the diverse range of experience among our customers and have written and organized the manual to be accessible to everyone. Of course it is more fun to use System 5-B than read about it but we assure you that your time reading this manual will be well spent.

Manual Structure

We recommend that everyone read this introduction in its entirety. Chapter 2 summarizes new features in this software revision. The manual contains the following chapters:

- Chapter 3: *Quickstart to Common Task*: Provides the fastest way to begin using System 5-B's basic features.
- Chapter 4: *eMix Application*: Discusses PatchNet, bus configuration, externals, system configuration, folddown, and diagnostics.
- Chapter 5: *CM401 Master Section*: Discusses System 5-B's master section including monitoring, communications, solo, and meters.
- Chapter 6: *CM402 Center Section*: Discusses the channel select, knobset select, and bus routing panels.
- Chapter 7: *Busses and Bus Masters*: Discusses the bus masters.
- Chapter 8: *Channels and Strips*: Discusses the physical area of the console used to control channels and the channel processing functions.
- Chapter 9: *Control Groups and Multi Format Masters*: Discusses how to use Control Groups and Multi Format Masters.
- Chapter 10: *Layouts and Snapshots*: Discusses how to store/recall channel-to-strip mappings (Layouts) to the console and how to store/recall channel functions (Snapshots).
- Chapter 11: *GPI/O Event System*: Discusses how to use the event system to program System 5-B.

How to Use the PDF

The Acrobat PDF version of this manual provided in your system can be a valuable “on-line help” learning tool while using System 5. We have included some amenities that we wish to explain for those not familiar with Acrobat:

- The Bookmarks on the left serve as a continuously visible table of contents while reading. Click on a subject heading to jump to that page. Click a + symbol to expand that heading to show subheadings. Click the - symbol to collapse the subheadings.
- The manual’s table of contents and list of figures are “active links” to their pages. Select the “hand” cursor, allow it to hover over the heading and turn into a “finger.” Then click to locate to that subject and page.
- All cross references are active links. Allow the “hand” cursor to hover over the reference, turn into a “finger,” and click to follow the reference.
- Use the left and right arrow keys on the top bar to go back and forth between views. This is a great way to follow a cross reference and return to the page from which you were reading.
- Select the **Find** item from the Edit menu (Ctrl-F) to search for a subject. This can be used as an “index on the fly.”
- Use the magnifying glass tool or the zoom edit box on the top bar to zoom in/out. This is helpful when examining a complex graphic or setting the text size for easy reading online.

Acrobat Reader version 5 or later is required to open the PDF. This can be downloaded for free at <http://www.adobe.com/products/acrobat/readstep2.html>.

1.2 Overview of the System Components

1.2.1 DF64 Digital Audio Frame

The DF64 Digital Frame performs all System 5-B audio processing: dynamics, EQ, busses (mix, record, aux, and monitor). System 5-B uses one *Mixer Model* (one DF64 with a SH612 Studio Hub), which has the following characteristics: 96 channels, 24 groups/clean feeds, 16 aux sends, 24 Mix sections and 24 external inputs).

1.2.2 Analog and Digital I/O

The engineer has complete freedom to decide how to route sources and destinations to the console, which easily handles 448 digital and analog sources.

Digital and analog I/O units connect all devices via MADI. All audio signals are converted to and from the MADI format through analog and digital converters. The System 5-B includes eight MADI Inputs and six MADI Outputs. Each 75- Ω coaxial MADI cable can carry up to 56 channels of 24-bit digital audio at 44.1 or 48 kHz. These MADI inputs and outputs appear at the console's internal router/patchbay. See *Console I/O* on page 55 for more information.

Microphone Inputs

Microphone inputs are handled by the ML530 Mic/Line Interfaces. Each unit contains 24 remote-controlled microphone preamps. Each ML530 is connected to a dedicated AM713 Analog to MADI Converter. A single system can include up to seven ML530s.

Monitoring

The MC524 Monitor Controller provides the following analog monitor outputs:

- Control Room Monitoring: Main (7.1), Alt 1 (5.1), and Alt 2 (stereo)
- Studio Monitoring: SLS (7.1), and Cues 1–3 (each stereo)
- Two talkback preamps and four listen microphone preamps

The MC524 is connected to a dedicated MA703 MADI to Analog Converter.

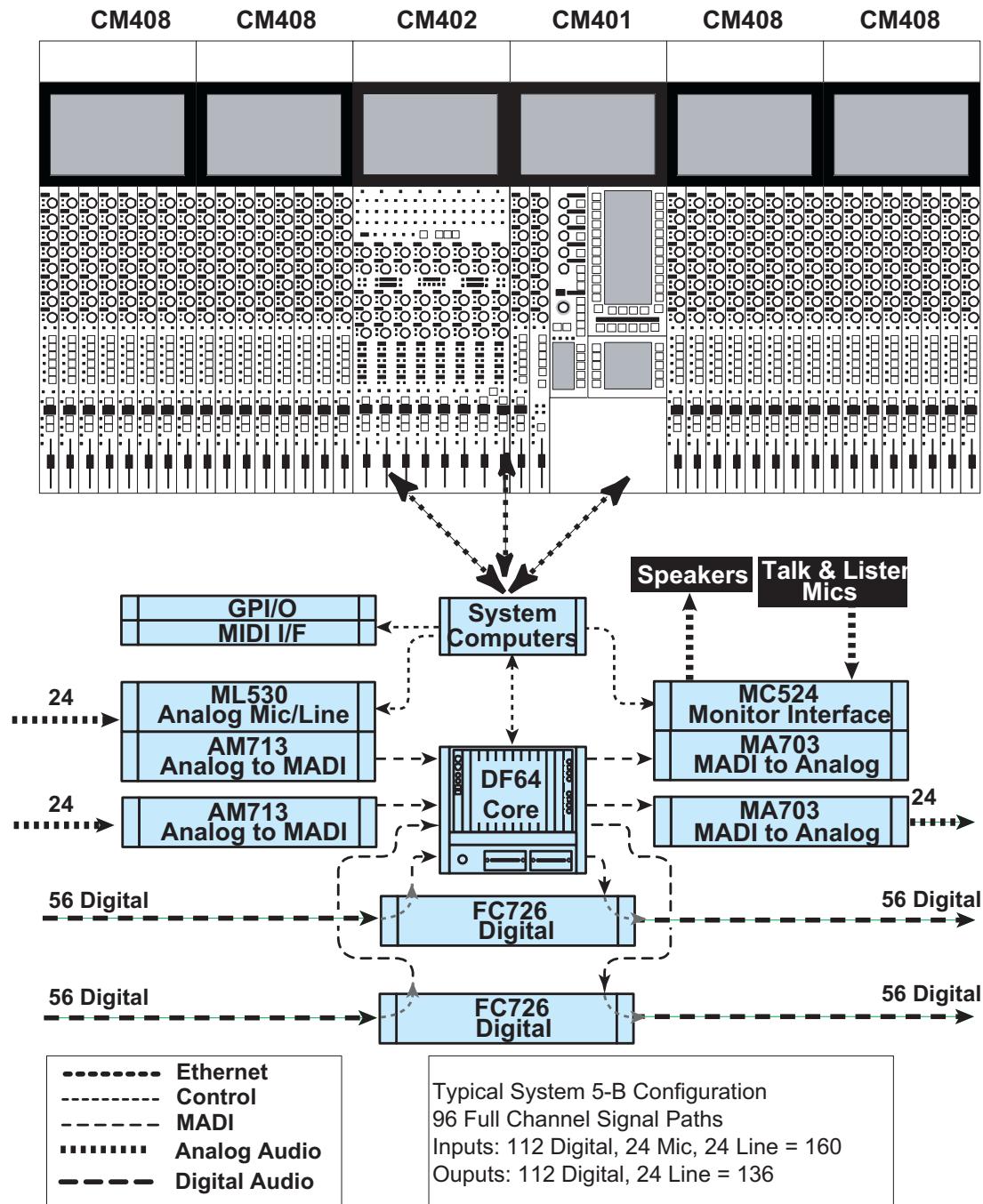


Figure 1-1 Typical System 5-B Hardware Configuration

1.2.3 Control Surface

System 5-B features a professional modular control surface that can be easily configured to suit a variety of operational layouts. The control surface connects to the DF64 Digital Frame via ethernet and the EuCon Hub; audio does not pass through the control surface.

The System 5-B control surface consists of a CM401 master section, a CM402 center section and multiple CM408 modules.

Channels and Strips

A CM408 module contains eight identical *Strips*. The Strip is the physical control area on the console that contains keys, knobs, displays, and a fader. A *Channel* performs all of the signal processing (EQ, dynamics, routing, gain, etc.). System 5-B has 96 channels, each of which may be assigned to a Strip. Each Strip has room for *Swap* and *Main* channels that can be toggled by pressing the **Swap** button. System 5-B allows tremendous flexibility assigning and controlling channels.

Channel Format

Most analog consoles are limited to mono or stereo channels. System 5-B supports mono and stereo channels as well as Multi Format Masters (LCRS, 5.1, 6.1, and 7.1) with multiple channels (see Chapter 8: *Control Groups and Multi Format Masters*).

1.3 Additional Hardware Components

The following hardware devices are also used in System 5-B:

- **System Computer (SC261)**: Runs the eMix software application; all file management and system setup is done from this computer.
See Chapter 4: *eMix Application*.
- **Interface Pilot Computer (PC253i)**: Supervises control functions for the analog monitor controller, remote microphone preamps, and transport control.
- **Digital Pilot Computer (PC253d)**: Controls the DF64 digital audio frame.
- **Studio Hub (SH612)**: This optional device can be used to add additional MADI ports to route audio to and from the DF64 digital audio frame.

NOTE: *This brief description to the System 5-B hardware components is intended to introduce the reader to the audio path in and out of the system. More detailed information about all of the hardware is covered in the System 5-B Technical Manual.*

1.4 System 5-B Startup Sequence

With all system components turned off:

1. Turn on the SC261 System Computer, the SH612 Studio Hub(s), all I/O units, the MIDI Interface, the TT007 and the GP132.
2. At the Windows Login Screen press Ctrl + Alt + Delete and click **OK** or press **Enter**.
There is no Administrator password.
3. The System Computer will finish booting to the Windows desktop.

With the system computer booted and the SH612 Studio Hub(s), all I/O units, the MIDI Interface, and the GP132 turned on:

1. Double-click the **eMix** icon on the desktop.
2. Turn on all of the Surface Modules, the PC253i Interface Pilot, all PC253d digital Pilots and the DF64s.
3. If the modules on the system have previously been saved as default, eMix will continue to boot when all modules reach 100%.
4. If modules appear as **Unexpected**, the user can select all of the modules by holding down the **Ctrl** key and clicking each of them. When all modules are selected, click **Save selected as default**, and confirm the selection by clicking **OK**.
5. Click **Continue** to finish booting eMix.

Since System 5-B has been designed for live, on-air applications, the system is designed to tolerate variations in the startup sequence. The system will boot properly if power is applied to all components simultaneously. If this occurs, be sure to check that all components are properly locked to a valid master digital sync source.

To restart the system:

1. Shutdown the System PC with the **Shutdown** button in the About View.
2. Reset the CM404 and CM408 surface modules.
3. Power off the Digital Pilot, Interface Pilot, and DF64 core.
4. Power on the System PC.
Since this takes the longest to boot, power it up first.
5. Power on the Digital Pilot and Interface Pilot.
6. Power on the DF64.(The DF64 must be off for 5 s before powering back on).
7. The system will boot the rest of the way by itself.

Chapter 2: New Features in Version 2.8.1

Mix Bus Terminology

Newer surface hardware now uses the term *Main Bus* instead of *Mix Bus*. The manual has been updated to reflect this change. The two terms can be used interchangeably.

Mixer Model

A new Mixer Model now supports 24 Aux sends.

USB Support

The System 5-B Computer now supports removable USB memory devices and drives. Removable USB devices can be used to save titles and configuration data.

Aux Bus Configuration

Aux send parameters (unity, pre-/post-fader, on/off, stereo/mono) can now be quickly set for multiple Aux sends. Level settings can be copied from Faders to Aux and from Aux to Aux. It is also possible to control Aux sends from the faders. Aux Sends now have a gain range from off to +12 dB to match the range of the channel fader (see page 85).

Fader Scale

There is a new optional fader scale that allows a larger range of motion around the 0 dB mark.

Global All Function

The dedicated **All** key on the CM401 now sets all strips to All Mode. This key was previously blank. See page 99 and page 83.

Clear Channel Assignment from Strip

The user can now remove a channel from a strip by holding the **Wave** key, pressing **Chan Select** and selecting **Blank**.

Chapter 3: Quickstart to Common Task

3.1 Connect and Play a CD

eMix Setup

1. Select **Drives** at the bottom of the eMix screen and choose a drive.
2. Click **Projects->New**, and name the new Project.
3. Click **Titles->New**, and name the new Title.
4. Click **Save the current title and mix data into the new title** to use the current Title's settings for the new Title (like Save As); click **Reset Console with Default Title settings** to use default Title settings.



Figure 3-1 New Title dialog

Assign Channels to Console

1. Select **Channels** from the main panel viewer in the console master section.
2. Select **Auto** then **Channel 1**.
3. Press **Chan Sel** keys for two neighboring console Strips.

This assigns Channels 1 and 2 to Strips n and n+1, respectively.

Patch the CD Player

1. Select **PatchNet** from bottom of the eMix screen and select **Console I/O**.
2. Select **A and B Inputs**.
3. Select the blue selection boxes for the **A Input** of channels 1 and 2.

The patch points show up in **Selected - Destinations**.

4. Connect the CD's digital output (AES or SDIF) to channels 1 and 2 on the DM714.
The DM714 should already be connected to the first input on the Studio Hub (SH612 1-1).
5. Select **Device Outputs**, then select **Hub 1-1** from the left of the screen.
6. Under **Device Outputs - Hub1-1**, click in the **Name** column for channel 1 and name the device *CD Player Left*; click in the **Name** column for channel 2 and name it *CD Player Right*.
7. Click the green selection fields next to channels 1 and 2 to add those patch points to **Selected - Sources**.
8. Click the **Patch** button.
9. Select **Console I/O**, select **A and B Inputs**, click in the **Name** column for channels 1 and 2 and name them *CDL* and *CDR*, respectively.

10. Press the **Main Panel** key and select **Channels**.

11. Press the **Setup** key and then press **Show Input Names**.

This displays the input names on the TFT display above the channel.

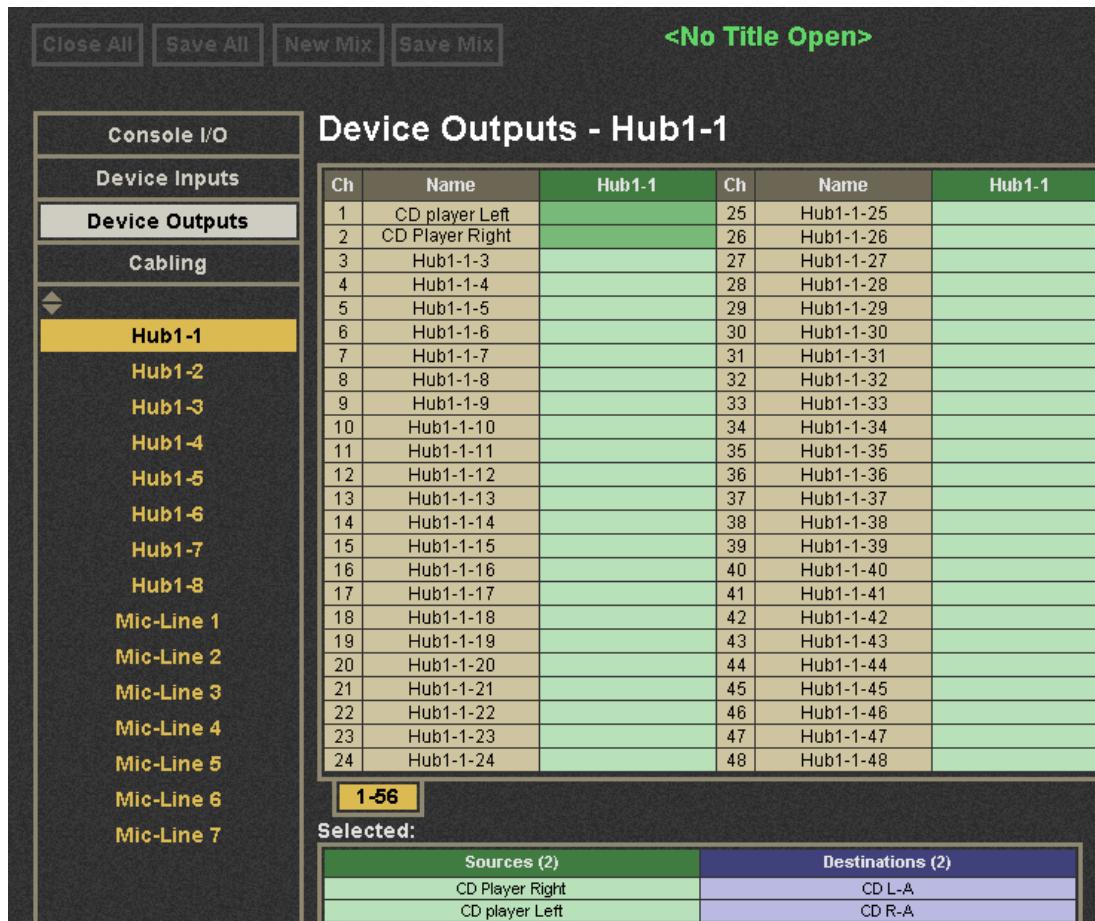


Figure 3-2 Device Outputs page in PatchNet

Route to the Mix Bus

1. Press the **Channel On** switches for each CD channel (*CDL* and *CDR*).
2. Select the **Mix** button on channels 1 and 2 (*CDL* and *CDR*).
3. Select the **In** key for the B Mix Bus (defaults to stereo).
4. In the Master Section, press the **CR Source** key to display the Mix sections in the Panel Viewer. Select the **B Source**.
5. Move the channel 1 and 2 faders up.
6. Press both channel's **Pan** buttons and set to L and R, respectively.
7. In the Master Section, press the **CR Output** key to display the output formats in the Panel Viewer and select **Stereo**.
8. Turn off the **Cut** button and use the **Main Monitor** knob in the Master Section to adjust the control room monitor level.

3.2 Connect and Monitor a Microphone

Configure PatchNet

1. From the left side of PatchNet, select the **Cabling** tab.
2. Select **MADI In Ports** and select **Hub 1-8** (any Hub can be selected).
3. Select **MADI Out Ports** and click in the **MADI Out** column next to Mic 1.
This tells the SH612 where the AM713 (which is connected to the ML530) is connected.
4. Click **Patch**.

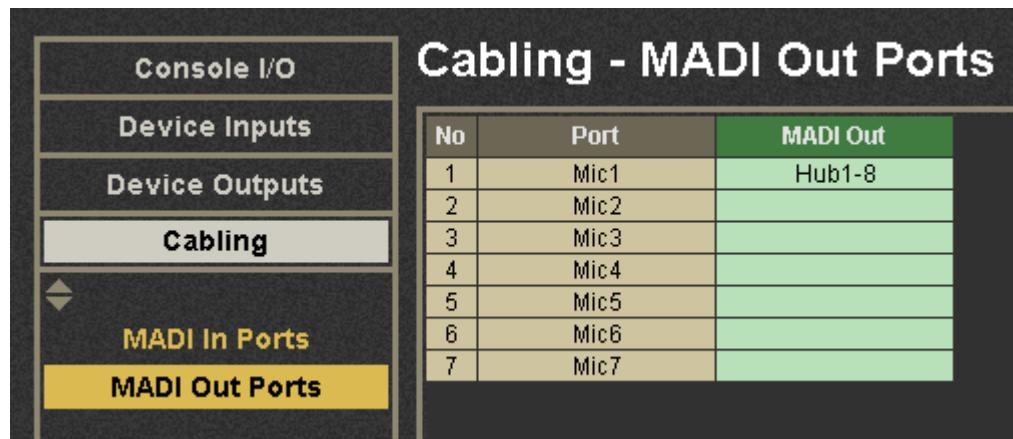


Figure 3-3 Cabling

Assign a Channel to the Console

1. Select **Channels** from the Main Panel Viewer.
2. Select **Auto** then **Channel 3**.
3. Press the **Chan Sel** key on a Strip.
4. Press the **Inpt** button on the strip, then turn the **Inpt** knob clockwise until the **B input** is selected.
5. Press the **►** button at the bottom of the knobset to display the B input page on the knobset.

Back to PatchNet

1. In PatchNet, select **Console I/O**, then select **A and B Inputs**.
2. Select the blue selection box for the B Input of **Channel 3**.
The patch point shows up in **Selected - Destinations**.
3. Select **Device Outputs**.

4. Select the green selection box for **Mic-Line 1, Ch 1**, and name the channel.

The patch point shows up in **Selected - Destinations**.

5. Click **Patch**.

The knobs on Channel 3 now display HiZ, 48V, HPF, Gain.

Device Outputs - Mic-Line 1		
No	Name	Mic-Line
1	Mic1-1	C3-B
2	Mic1-2	
3	Mic1-3	
4	Mic1-4	
5	Mic1-5	
6	Mic1-6	
7	Mic1-7	
8	Mic1-8	
9	Mic1-9	
10	Mic1-10	
11	Mic1-11	
12	Mic1-12	
13	Mic1-13	
14	Mic1-14	
15	Mic1-15	
16	Mic1-16	
17	Mic1-17	
18	Mic1-18	
19	Mic1-19	
20	Mic1-20	
21	Mic1-21	
22	Mic1-22	
23	Mic1-23	
24	Mic1-24	

Figure 3-4 Microphone assignment in Device Outputs

Route to the Mix Bus

1. Plug a microphone into Channel 1 of the ML530.
2. To listen to the mic return, press the **Mix** button on channel 3 and select the **In** key of the B Mix bus.
3. In the Master Section, press the **CR Source** key to display the Mix sections in the Panel Viewer and select the **B Source**.
4. Activate channel 3's **ON** switch, move its fader up, and set the **Pan** to center.
5. In the Master Section, press the **CR Output** key to display the output formats in the Panel Viewer and select **Stereo**.
6. Turn off the **Cut** button and use the **Main Monitor** knob in the Master Section to adjust the control room monitor level.

Chapter 4: eMix Application

The eMix application has tabs along the bottom of the window to select between the following subjects:

- **Directory:** file management
- **Patchnet:** digital patchbay
- **Busses:** formatting of group busses and main sections
- **System:** system setup
- **Folddown:** folddown formats
- **Masters:** format master channels (see Chapter 9: *Control Groups and Multi Format Masters*) and externals
- **Events:** GPI/O event configuration (see Chapter 11: *GPI/O Event System*)
- **Diagnostics:** Summary of system status

Each tab is discussed in the following sections.

4.1 Directory

The Directory tab contains its own tabs right above the main eMix tabs: **Drives**, **Projects**, **Titles**, and **Mixes**. The order of these tabs also represents their hierarchy (i.e., a Title is within a Project located on a Drive). Operations in the Directory are almost identical to those in Windows.

4.1.1 Projects

Browse Existing Project

1. Click the **Drives** tab to see a list of available Drives.
2. Single-click to select the desired Drive and click the **Projects** tab button or double-click the Drive.
The Projects Window opens with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.
The Titles Window opens with a list of Titles in that Project.

Open or Create a Project

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.
The Projects Window appears with a list of Projects on that Drive.
3. To create a new Project, click the **New** button along the right side of the Projects window.
Name the new Project in the dialog that appears.
To open an existing project, double-click a Project or select it and click the **Titles** tab. The Titles Window appears.

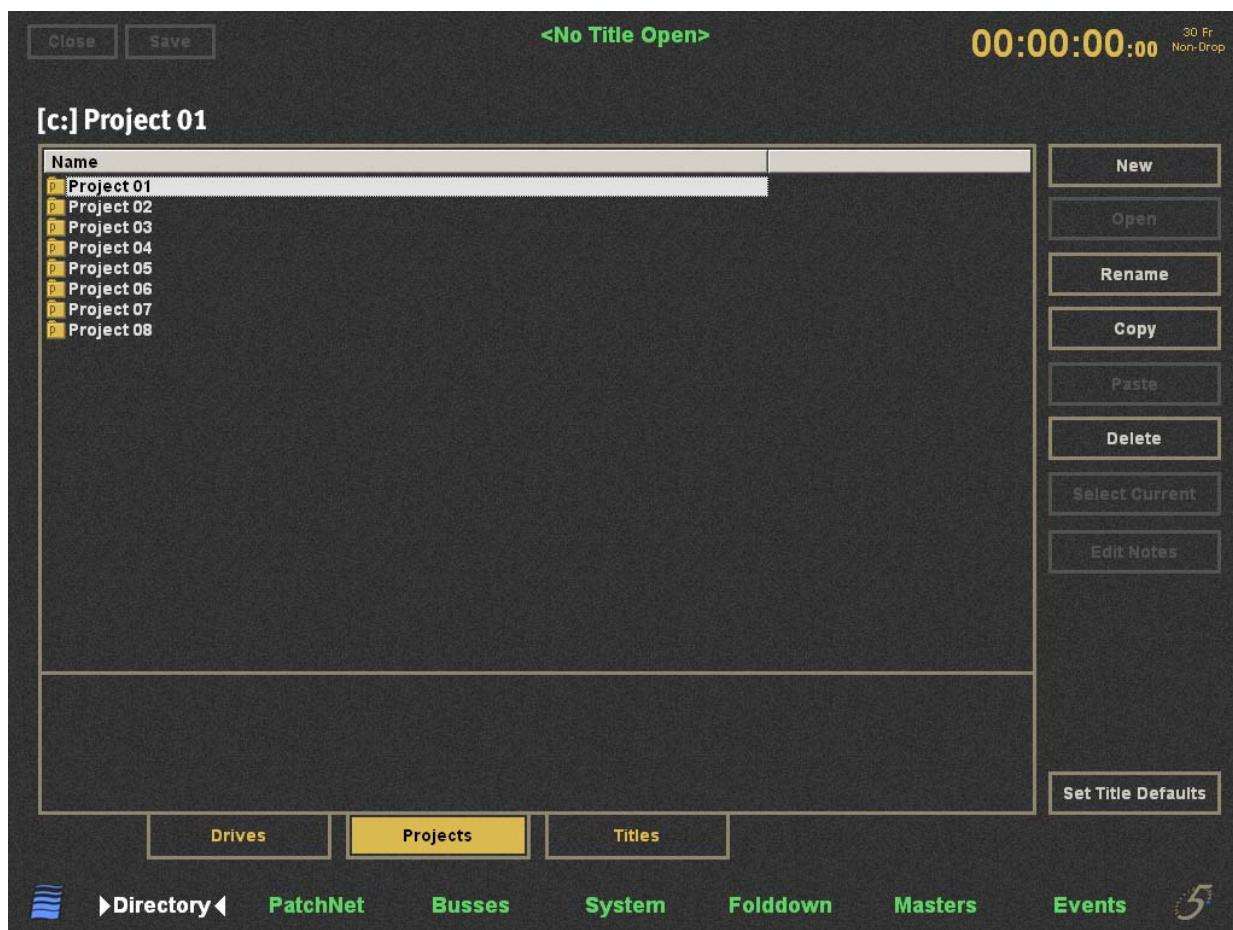


Figure 4-1 Projects Window

Rename, Copy, Paste, or Delete a Project

These buttons are arranged vertically along the right side of the Projects Window. Copying a Project and pasting it to another Drive is the easiest way to backup a Project.

Select a Project from the Projects Window.

- Click the **Copy** button to copy the selected Project.
The **Paste** button remains dim until the **Copy** button is used.
- Click the **Paste** button to paste the copied Project. Of course, you can navigate the Directory to another Drive before pasting.
If the selected Project's name is *Test*, the copied Project is *Copy of Test*.
- Click the **Rename** button to rename the selected Project in the dialog that appears.
- Click the **Delete** button to delete the selected Project.
The Project is deleted and *does not get copied to the Copy buffer*.

4.1.2 Titles

A Project must exist before selecting, opening, or creating a new Title. The **Rename**, **Copy**, **Paste**, and **Delete** buttons work the same on Titles as described above for Projects.

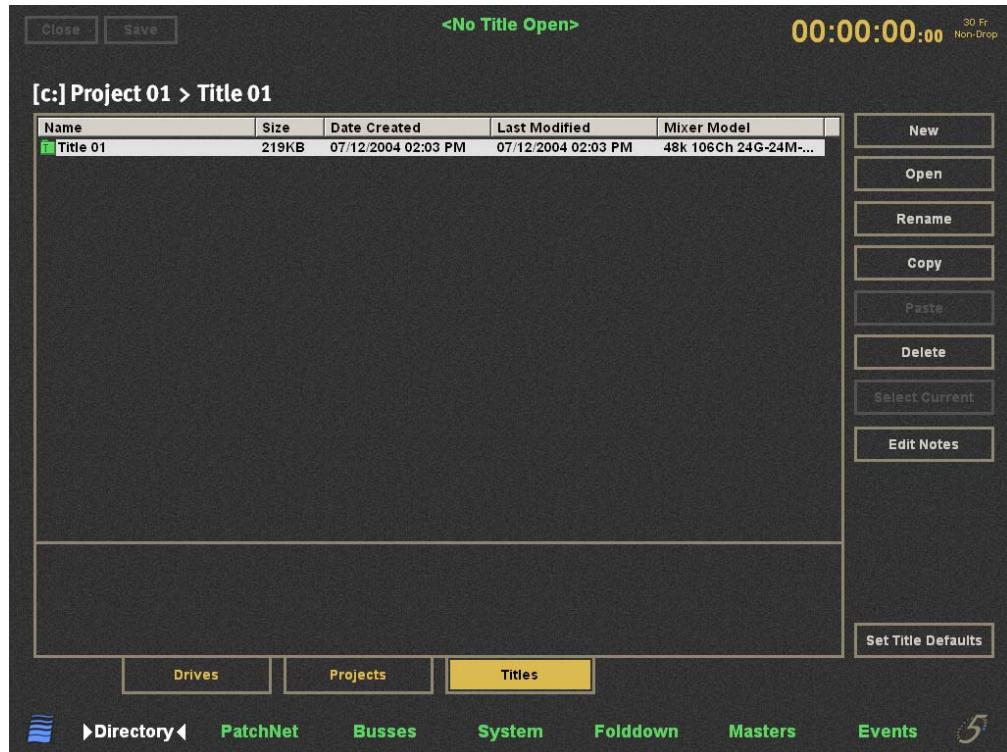


Figure 4-2 Titles Window

Create a New Title

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.
The Projects Window appears with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.
The Titles Window appears with all Titles in that Project.
4. Click the **New** button along the right side of the Titles window.
The **New Title** dialog appears.



Figure 4-3 New Title dialog

5. Name the new Title and select one of the **Creation Options** radio buttons:
 - **Save the current title and mix data into the new title:** Uses the current state of the console for the new Title (like Save As).
 - **Reset Console with Default Title settings:** Uses settings from the Default Title for the new Title. See page 36 to see how to change the default settings.

Open an Existing Title

1. Click the **Drives** tab to see a list of available Drives.
2. Select the desired Drive and click the **Projects** tab or double-click the Drive.
The Projects Window appears with a list of Projects on that Drive.
3. Select a Project and click the **Titles** tab or double-click the Project.
The Titles Window appears with all Titles in that Project.
4. To open the Title, select the Title and click **Open**.

4.1.3 Operations on Current Title



Figure 4-4 File operations buttons for current Title

The two buttons at the top of each Directory Window provide an easy way to operate on the currently open Title from any window. They are dim if a Title is not open.

Close and **Save** close and save the Title, respectively.

Select Current

Click the **Select Current** button to instantly navigate back to the currently open Mix in the Mixes Window. This is a convenient way to browse the Directory without losing your place.

Edit Notes

Click the **Edit Notes** button to enter information about the Title.

4.1.4 Title Defaults

This section describes how to set up basic PatchNet settings. This process includes naming the device inputs and outputs and connecting group bus outputs to multitrack inputs. The setup process is equivalent to setting and labeling the normalled connections on a conventional patch.

NOTE: To clarify the use of the terms **Inputs** and **Outputs** in PatchNet, **Device** pertains to equipment other than the System 5-B console. Therefore, **Device Inputs** refers to **inputs to an external device**, not the console.

The following settings are stored to the Title Defaults and are automatically included with each new Title:

- PatchNet settings and names
- Bus Setup: names and formats
- Externals Setup: names and formats
- SnapShots
- Layouts
- Meter setups

Setting the Title Defaults

The Title Defaults can be set by clicking the **Set Title Defaults** button on the Titles page in PatchNet. This copies all settings listed above from the currently open Title into the Title Defaults for the current Mixer Model. The warning in Figure 4-5 appears to confirm this action.



Figure 4-5 Updating Title Defaults warning

Normalised Connections

The inputs and outputs that require normalised connections should be designated in PatchNet and saved to the Title Defaults.

In this example, the console group bus outputs 1–24 should be hardwired to both the R-1 and DAW inputs. Figure 4-6 shows the Group Bus outputs patched to the R-1 inputs.

If a Source is normalised to multiple destinations (i.e., R-1 and DAW), <MULT> appears in the blue cell next to the source name.

Device Inputs - Frame1-5			
Ch	Name	Frame1-5	Ch
1	R-1In Tk 1	Grp1-Bus-Out	25
2	R-1In Tk 2	Grp2-Bus-Out	26
3	R-1In Tk 3	Grp3-Bus-Out	27
4	R-1In Tk 4	Grp4-Bus-Out	28
5	R-1In Tk 5	Grp5-Bus-Out	29
6	R-1In Tk 6	Grp6-Bus-Out	30
7	R-1In Tk 7	Grp7-Bus-Out	31
8	R-1In Tk 8	Grp8-Bus-Out	32
9	R-1In Tk 9	Grp9-Bus-Out	33
10	R-1In Tk 10	Grp10-Bus-Out	34
11	R-1In Tk 11	Grp11-Bus-Out	35
12	R-1In Tk 12	Grp12-Bus-Out	36
13	R-1In Tk 13	Grp13-Bus-Out	37
14	R-1In Tk 14	Grp14-Bus-Out	38
15	R-1In Tk 15	Grp15-Bus-Out	39
16	R-1In Tk 16	Grp16-Bus-Out	40
17	R-1In Tk 17	Grp17-Bus-Out	41
18	R-1In Tk 18	Grp18-Bus-Out	42
19	R-1In Tk 19	Grp19-Bus-Out	43
20	R-1In Tk 20	Grp20-Bus-Out	44
21	R-1In Tk 21	Grp21-Bus-Out	45
22	R-1In Tk 22	Grp22-Bus-Out	46
23	R-1In Tk 23	Grp23-Bus-Out	47
24	R-1In Tk 24	Grp24-Bus-Out	48

Figure 4-6 Device Inputs normalised

Layouts

Layouts store the mapping of channels to strips on the console surface. See *Layouts* on page 130 for more information.

The following useful layout is typical:

- Strips 1–24
Main: Channels 1–24; Swap Channels 25–48
- Strips 25–48
Main: Channels 25–48; Swap Channels 49–72

Meter Presets

The meters can be configured and stored as presets so they appear in their most useful formats. See *Meters* on page 70 for more information.

The following are useful meter presets:

- All meters single; follow fader
- All meters single; Group Bus Outputs
- All meters single; Main Bus Outputs
- All meters single; Aux Sends
- 1–24 Dual: Fader + Group Bus 1–24

4.2 PatchNet

PatchNet is a digital patching system that uses a MADI routing hub to connect sources to destinations.

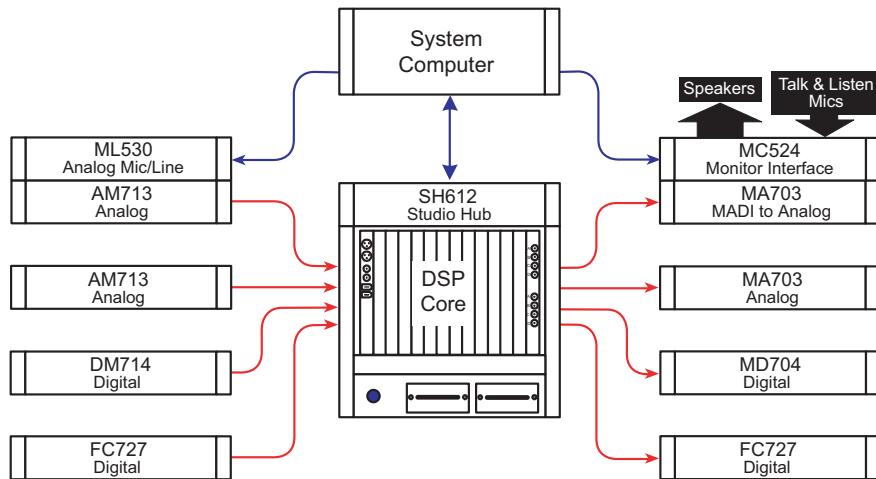


Figure 4-7 Simplified MADI routing diagram

The following Euphonix devices provide a robust and complete I/O interface:

- The DM714 (AES/EBU-to-MADI) and MD704 (MADI-to-AES/EBU) converters provide 26 channels of digital I/O.
- The AM713 (analog-to-MADI) and MA703 (MADI-to-analog) converters provide 26 fixed-gain channels of analog I/O.
- The ML530 provides 24 remote, variable gain, analog, mic/line preamps that can be controlled from the Strip on the console surface.
- The FC727 and FC726 provide 56 channels of digital format conversion.

Some equipment, such as the Euphonix R-1, the Sony 3348HR recorder, and some high end consoles, offer a MADI interface. Most other equipment, however, (i.e., mics, speakers, DAWs that support AES/EBU and vintage gear) must have their inputs and outputs converted to and from MADI using the appropriate Euphonix converter.

PatchNet allows connections between the console and external devices in exactly the same way as a conventional analog patchbay. The crucial difference is that once a patch is made it can be saved and recalled with the Title.

NOTE: To clarify the use of the terms **Inputs** and **Outputs** in PatchNet, **Device** pertains to equipment other than the System 5-B console. Therefore, **Device Inputs** refers to **inputs to an external device, not the console.**

In an analog studio, the patchbay is hardwired to all the equipment supplied with the room. The multitrack is normalled to the console line inputs, the mics to the console mic inputs, and the outboard gear is ready to be patched into channels.

System 5-B must be initially set up so all studio equipment appears on the PatchNet screen labelled and normalled correctly for a session. This basic wiring information is stored in the Title Default so these settings can be used when starting a new session with a new Title. To set up the System 5-B studio wiring and set the Title Default, see *Title Defaults* on page 36.

Enter PatchNet by clicking the **PatchNet** tab at the bottom of the eMix screen. PatchNet has four categories: Console I/O, Device Inputs, Device Outputs, and Cabling.

4.2.1 Console I/O

Click **Console I/O** on the upper-left of the PatchNet window, then click **A and B Inputs** from the sub-categories below it (Figure 4-8). Click in the **Name** field and type a name for a channel. This is where connections to the channel's A and B inputs are made.



Figure 4-8 Console I/O A and B inputs Window

Figure 4-9 shows the lower part of the Console I/O window. The **Selected:** area shows the sources and destinations for the **A Input** and **B Input** cells selected above. The numbered tabs (1–48 etc.) display additional pages of patchpoints. The four buttons on the right of Figure 4-9 perform the following functions:

- **Patch:** Makes a connection between selected patchpoints
- **Unpatch:** Breaks the connection between selected patchpoints
- **Clear:** Deselects selected patchpoints
- **View Log:** Shows a log of failed patches



Figure 4-9 Bottom of Console I/O window

4.2.2 Device Inputs and Outputs

There are up to 12 MADI device input/output ports on the console, each carrying up to 56 channels (44.1/48 kHz) or 28 channels (96 kHz).

NOTE: To clarify the use of the terms **Inputs** and **Outputs** in PatchNet, **Device** pertains to equipment other than the System 5-B console. Therefore, **Device Inputs** refers to **inputs to an external device**, not the console.

4.2.3 Cabling

This category handles MADI cable connections for the ML530 Mic/Line Interfaces.

Mic/Line Interface Patching

For mic inputs and analog inputs not at +4 dB, the Euphonix ML530 provides 24 preamps each with gain, phantom power, high-pass filter, and hiZ/loZ switching. The analog outputs are connected to an AM713 Analog to MADI converter which then connects to one of the MADI inputs on the SH612 Studio Hub.

For each ML530, PatchNet needs to know which MADI input the associated AM713 is connected to so the mic preamp parameters appear on the corresponding input channel knobset. For each Mic/Line Interface, note how it is connected. In the following example, two ML530s are each connected to an AM713. The two AM713s have been connected to the inputs of the SH612 at Hub1-1 and Hub1-2, respectively.

1. Select **Cabling** in PatchNet.
2. Select the **MADI Out Ports** sub-category.

The list shows 7 Mic/Line Interfaces but only configure those wired to the Hub (i.e., Mic1 and Mic2).
3. Click and drag through the cells to the right of Mic1 and Mic2.

The cells highlight and the names appear in the **Sources** column of the **Select-ed:** window below.
4. Select the **MADI In Ports** sub-category.
5. Click and drag through the cells to the right of the two Hub1 inputs (Hub1-1 and Hub1-2).

The cells highlight and the names appear in the **Destinations** column of the **Selected:** window below.
6. Click the **Patch** button to make the patch.

PatchNet now knows how the two mic/line interfaces are connected so the proper input parameters appear at the top of the channels they are connected to.

Because Hub1-1 and Hub1-2 have been designated as MADI connections to the Mic/Line interfaces, clicking on the Hub1-1 and Hub1-2 sub-categories in **Device Outputs** show **Device Patch** in the first 24 cells and will not allow selection unless they are unpatched.

4.2.4 Patching Examples

Patch 12 mics into channels 25–36

Select the Sources

1. Click on **Device Outputs** from the four PatchNet categories.
2. Click on **Mic-Line 1** from the sub-categories.

This displays all inputs in the center of the window from the first Mic-Line Interface. The Mic-Line Interface was connected as part of the initial studio setup.

Device Outputs - Mic-Line		
No	Name	Mic-Line
1	Mic1-1	
2	Mic1-2	
3	Mic1-3	
4	Mic1-4	
5	Mic1-5	
6	Mic1-6	
7	Mic1-7	
8	Mic1-8	
9	Mic1-9	
10	Mic1-10	
11	Mic1-11	
12	Mic1-12	
13	Mic1-13	
14	Mic1-14	
15	Mic1-15	
16	Mic1-16	
17	Mic1-17	
18	Mic1-18	
19	Mic1-19	
20	Mic1-20	
21	Mic1-21	
22	Mic1-22	
23	Mic1-23	
24	Mic1-24	

1-24

Selected:

Sources (12)
Mic1-5
Mic1-6
Mic1-7
Mic1-8
Mic1-9
Mic1-10
Mic1-11
Mic1-12

Figure 4-10 Device Outputs window

3. Select Mic1-1–Mic1-12 from the **Mic-Line** column by clicking and dragging through the cells.

These entries are highlighted in green in Figure 4-10. These sources appear in the **Sources** column of the **Selected:** window below. If there were more than 24 sources, additional tabs would appear to the right of the **1-24** tab.

Select the Destinations

PatchNet allows connections to be made from:

- one source to one destination;
- an equal number of sources to destinations;
- one source to multiple destinations.

Multiple sources cannot be routed to one destination.

To set the destinations for the 12 mics:

4. Select the **Console I/O** category and the **A and B Inputs** sub-category.
5. Click and drag through the **A Input** column next to C25–C36 to select channels 25–36.

The entries are highlighted in blue and the list of A input channels appear in the **Destinations** column in the **Selected:** window below (Figure 4-11).

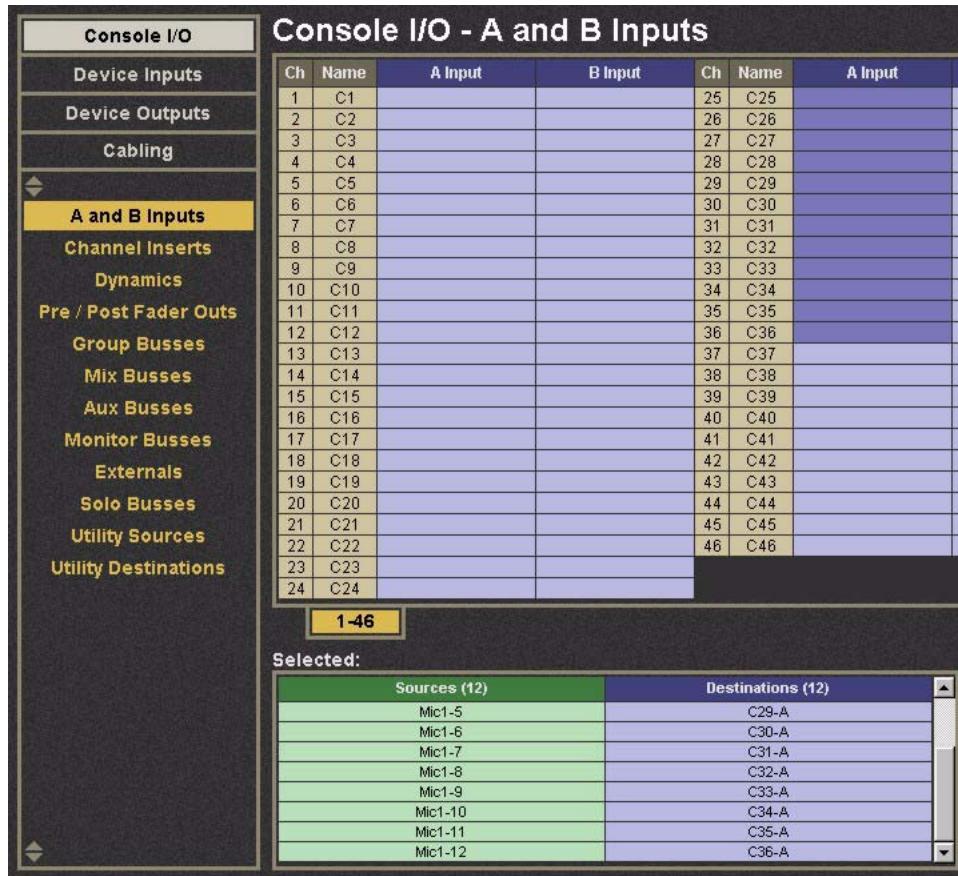


Figure 4-11 Selecting destination channels

6. Click the **Patch** button to make the connection.

The sources and destinations appear in the **A Input** and **Name** columns, respectively (Figure 4-12). The sources and destinations are cleared from the **Selected:** area.

Ch	Name	A Input
25	C25	Mic1-1
26	C26	Mic1-2
27	C27	Mic1-3
28	C28	Mic1-4
29	C29	Mic1-5
30	C30	Mic1-6
31	C31	Mic1-7
32	C32	Mic1-8
33	C33	Mic1-9
34	C34	Mic1-10
35	C35	Mic1-11
36	C36	Mic1-12

Figure 4-12 Mics Patched to Channels***Patch the multitrack returns into channels 1–24***

1. Click on the **Device Outputs** category to access the outputs from the R-1.
2. Click on the **Hub1-3** sub-category.
This is where the R-1 is hardwired.
3. Click and drag through the first 24 cells in the Hub1-3 column.
These cells are highlighted in green and their names appear in the **Sources** column in the **Selected:** window below.
4. Select the **Console I/O** category.
5. Select the **A and B Inputs** sub-category.
6. Click and drag through the first 24 cells in the **A Input** column.
These cells are highlighted in blue and their names appear in the **Destinations** column in the **Selected:** window below.
7. Click the **Patch** button to make the connection.
The sources and destinations appear in the **A Input** and **Name** columns, respectively. The sources and destinations are cleared from the **Selected:** area.
After connecting the 12 mics and the R-1 returns, the Console I/O A and B Inputs Window is shown in Figure 4-13.

Console I/O - A and B Inputs							
Ch	Name	A Input	B Input	Ch	Name	A Input	B Input
1	C1	R-1 Out Tk 1		25	C25	Mic1-1	
2	C2	R-1 Out Tk 2		26	C26	Mic1-2	
3	C3	R-1 Out Tk 3		27	C27	Mic1-3	
4	C4	R-1 Out Tk 4		28	C28	Mic1-4	
5	C5	R-1 Out Tk 5		29	C29	Mic1-5	
6	C6	R-1 Out Tk 6		30	C30	Mic1-6	
7	C7	R-1 Out Tk 7		31	C31	Mic1-7	
8	C8	R-1 Out Tk 8		32	C32	Mic1-8	
9	C9	R-1 Out Tk 9		33	C33	Mic1-9	
10	C10	R-1 Out Tk 10		34	C34	Mic1-10	
11	C11	R-1 Out Tk 11		35	C35	Mic1-11	
12	C12	R-1 Out Tk 12		36	C36	Mic1-12	
13	C13	R-1 Out Tk 13		37	C37		
14	C14	R-1 Out Tk 14		38	C38		
15	C15	R-1 Out Tk 15		39	C39		
16	C16	R-1 Out Tk 16		40	C40		
17	C17	R-1 Out Tk 17		41	C41		
18	C18	R-1 Out Tk 18		42	C42		
19	C19	R-1 Out Tk 19		43	C43		
20	C20	R-1 Out Tk 20		44	C44		
21	C21	R-1 Out Tk 21		45	C45		
22	C22	R-1 Out Tk 22		46	C46		
23	C23	R-1 Out Tk 23					
24	C24	R-1 Out Tk 24					

1-46

Figure 4-13 R-1 and mics patched

4.2.5 Main Bus Send/Return

Click the **Console I/O** category and then click the **Main Busses** sub-category. Each main bus has a send and return. In Figure 4-14, the first six sends (a 5.1-channel main section) are routed to channels 41–46 A inputs. The insert is switched in/out from the Bus Masters Config Page (see *Bus Master Inserts* on page 88).

Console I/O - Main Busses				
Bs	Send	Return	Out	Mix Return
1	C41-A	C41-Post-Fader	Genex In 1	
2	C42-A	C42-Post-Fader	Genex In 2	
3	C43-A	C43-Post-Fader	Genex In 3	
4	C44-A	C44-Post-Fader	Genex In 4	
5	C45-A	C45-Post-Fader	Genex In 5	
6	C46-A	C46-Post-Fader	Genex In 6	
7				

Figure 4-14 Main Bus Send and Return ?graphic

For every Main Section, there is a corresponding return in the same format, which allows patching the Main Section recorder output back into the console. The Main Section Return can be routed to the monitors from the Main Section page in the CR Source Panel (see *Control Room Monitor Controls* on page 58).

4.2.6 Monitor Patching

The monitor outputs are automatically routed to the MC524 Monitor Controller supplied with System 5-B and are ready to be normalled to the speaker inputs. The monitor feeds are also available within PatchNet for routing to other destinations, if necessary.

Click on the **Console I/O** category and the **Monitor Busses** sub-category. This window shows all 22 monitor feeds:

Monitor	Busses	Format
1–8	Control Room	L, C, R, Sl, Sr, Bm, X, Y
9–16	Mon A	L, C, R, Sl, Sr, Bm, X, Y
17–18	Mon B	L, R
19–20	Mon C	L, R
21–22	Mon D	L, R

Table 4-1 Monitor Busses

The Cascade inputs allow for direct bus injection prior to the insert point into all monitor signal paths.

4.2.7 Solo Bus and Utility Patching

The **Solo Busses** sub-category in **Console I/O** allows custom patching into the stereo Solo Bus.

The **Utility Sources** sub-category includes the Oscillator output. The **Utility Destinations** sub-category includes the Slate In which must be patched to the Talkback mic feed from the Monitor Interface.

4.2.8 Talkback Signal Patching

The two talkback mics are wired to the MC524 Monitor Controller. They are summed and amplified to produce a single talkback signal. This analog signal must be fed into the system through an AM713 Analog to MADI converter.

To send talkback to the busses, this signal must be patched to the Slate Input (in the **Utility Destinations** subcategory of the **Console I/O** category). Note which AM713 analog-to-MADI converter input the talkback signal has been hardwired to and patch that channel to the Slate Input.

4.3 Busses

Click the **Busses** tab at the bottom of the eMix window to display the Busses window. At the bottom left of the window, click either the **Group** or **Main** buttons to configure the Group or Main sections, respectively (Figure 4-15 shows the Main sections; Figure 4-16 shows Group sections). Group busses and Main sections differ in two ways:

- There are 16 Main sections but only one set of Group busses.
- Main sections have associated recorder playback returns.

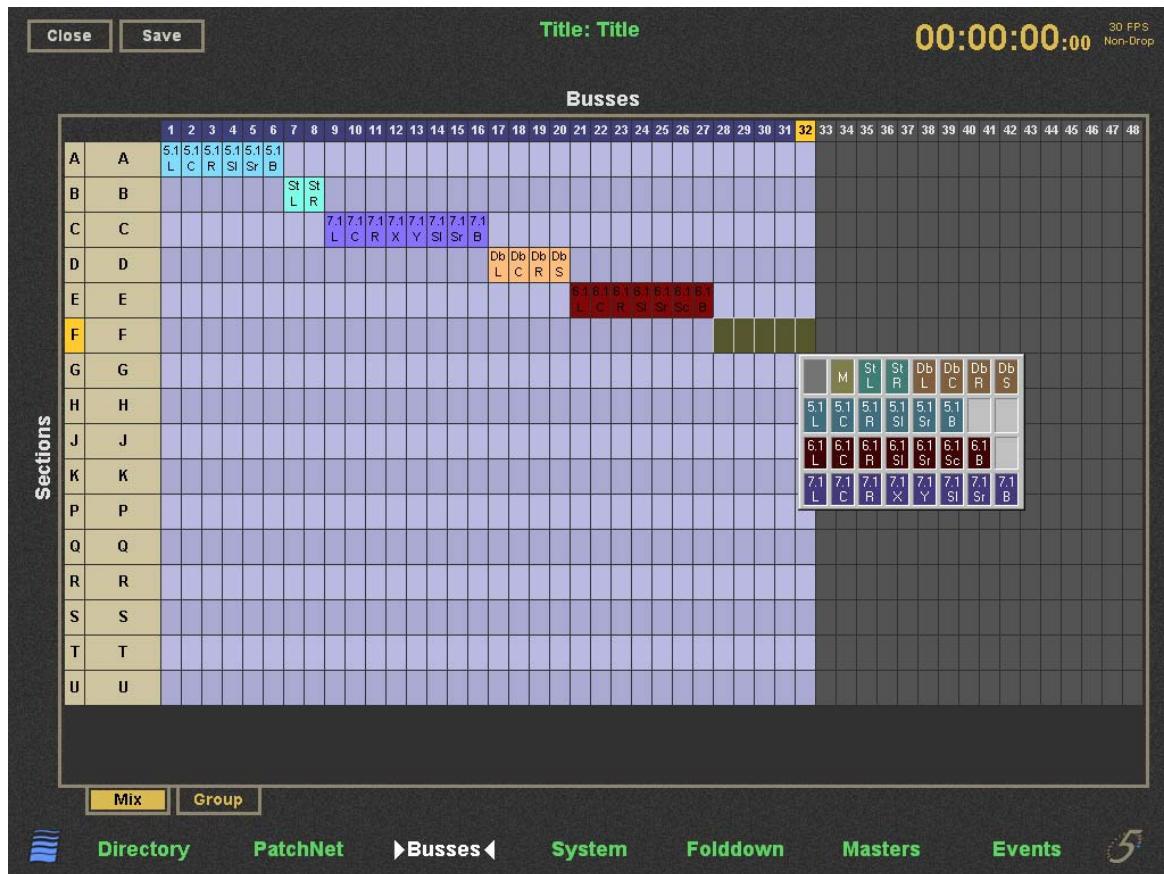


Figure 4-15 Main Bus Window with law palette



Figure 4-16 Group Bus Window

The letters at the far left of Figure 4-15 denote the 16 Main sections. The letters “I” and “L” have been omitted to avoid being confused with one another. Click the cell to the right of the letter to name the section. The number of busses available is indicated by the blue area in Figure 4-15 (i.e., there are 32 busses). The gray area represents busses that are not available due to the present system configuration.

4.3.1 Law Palette

To set the pan law for a Main section:

1. Click and drag across the busses you wish to configure.
2. Right-click on any of the selected cells to display the Law Palette.

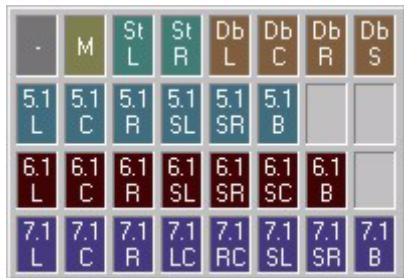


Figure 4-17 Law Palette

The possible formats are:

Symbol	Format
-	remove an existing law from a bus
mono	M
stereo	St L, St R
Dolby Surround	Db L, Db C, Db R, Db S
5.1	L, C, R, SL, SR, B
6.1	L, C, R, SL, SR, SC, B
7.1	L, C, R, LC, RC, SL, SR, SC, B

Table 4-2 Law Palette Formats

3. Select the desired pan law by dragging across the Law Palette and releasing the mouse when the cursor is within that Law.

Individual cells can also be assigned by right-clicking and selecting one entry at a time from a pan format. Right-click on a format entry to cycle through the channels to reassign the order.

4.4 Externals

Click the **Masters** tab at the bottom of the eMix window. At the bottom left of the window, click the **Externals** button to configure the Externals. Externals are configured in the same way as Main and Group busses.

4.5 System

4.5.1 Mixer Model

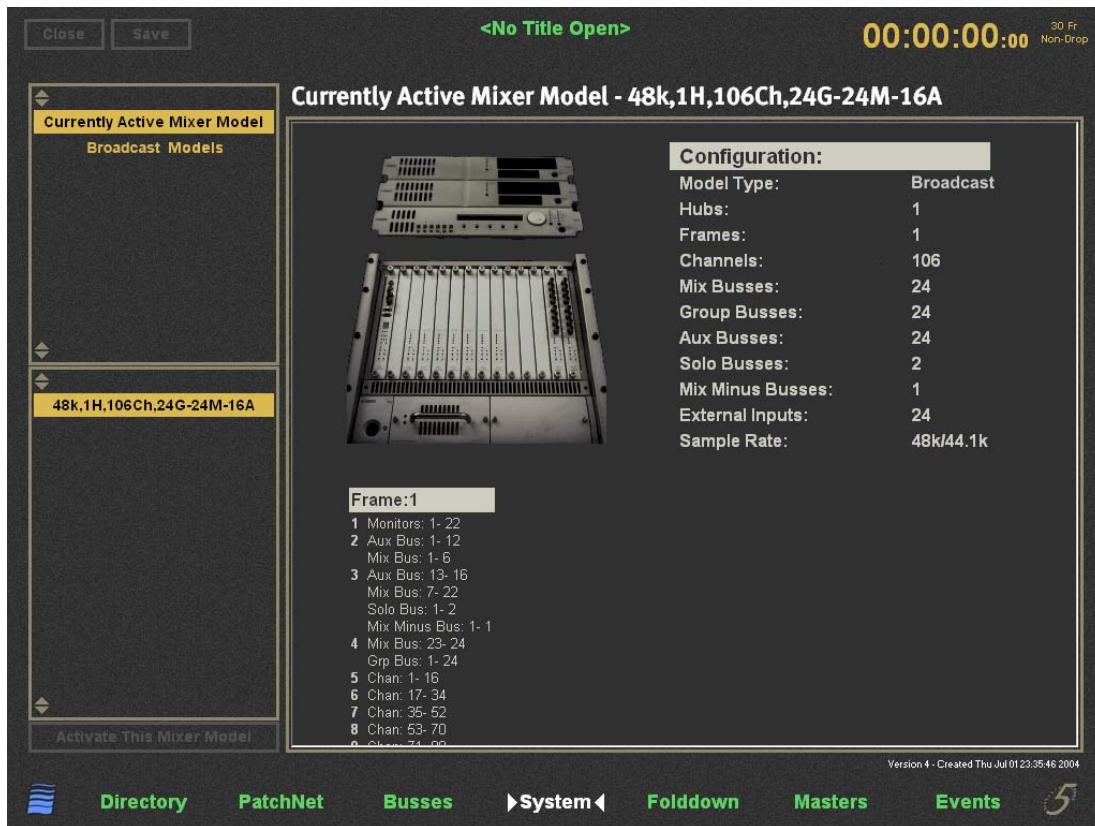


Figure 4-18 Mixer Model

System 5-B uses only one mixer model.

4.6 Foldown

Click the **Foldown** tab at the bottom of any eMix window to display the Foldown window (Figure 4-19). This window allows you to set rules by which one monitor output format (Format In along the left) is converted to a different format (Format Out on top). For example, to convert a 5.1-channel mix to LCRS, you could map the Boom channel to all channels attenuated by 6 dB and the SI and Sr to the S channel without attenuation.

To maintain all audio information present in the original format, each **Format In** channel is usually mapped to some channel(s) in the **Format Out**. However, this is not mandatory: One might choose to omit the Boom channel because the speakers in the output format cannot handle bass below a certain frequency.

Click in any cell and type in the amount of attenuation (-17 to 0 dB) that the Format In channel will undergo as it is routed to the Format Out channel. Click and drag across multiple cells to enter an amount for all selected cells. Right-click on selected cells to display a menu with two options:

- **Clear:** Clears values so no signal is routed.
- **Default:** Sets cells to their factory default values. This occurs even in a stored preset.

There are 24 presets available to store and recall different Foldown settings. The **Recall Preset** and **Store Preset** buttons are on the top-right of the window.

	Format Out												Recall Preset		Store Preset			
	Mono C	Mono L	Mono R	St L	St R	LCRS L	LCRS C	LCRS R	LCRS S	3.1 L	3.1 C	3.1 R	3.1 SI	3.1 Sr	3.1 B	7.1 L		
Format In																		
Mono C	0.00	-3.00	-3.00	-3.00	-3.00	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80				-7.00		
Mono L	-15.00	-3.00	-3.00	0.00		0.00				0.00						0.00		
Mono R	-15.00	-3.00	-3.00		0.00		0.00				0.00					0.00		
St L	-15.00	-3.00	-3.00	0.00		0.00				0.00						0.00		
St R	-15.00	-3.00	-3.00		0.00		0.00				0.00					0.00		
LCRS L	-15.00	-3.00	-3.00	0.00		0.00				0.00						0.00		
LCRS C	-15.00	-3.00	-3.00	-3.00		0.00					0.00					0.00		
LCRS R	-15.00	-3.00	-3.00		0.00		0.00				0.00					0.00		
LCRS S	-4.50	-6.00	-6.00	-6.00				0.00			0.00	0.00						
3.1L	-3.00	-3.00	-3.00	0.00		0.00				0.00						0.00		
3.1C	-3.00	-3.00	-3.00	-3.00		0.00					0.00					0.00		
3.1R	-3.00	-3.00	-3.00		0.00		0.00				0.00					0.00		
3.1SI	-6.00	-6.00	-6.00	-6.00				0.00			0.00							
3.1Sr	-6.00	-6.00	-6.00		-6.00			0.00				0.00						
3.1B	-6.00	-3.00	-3.00	-3.00	-6.00	-6.00	-6.00	-6.00					0.00					
7.1L	-3.00	-4.80	-4.80	0.00		0.00			0.00							0.00		
7.1Li	-3.00	-4.80	-4.80	-0.34	-16.70	-3.00	-3.00			-3.00	-3.00							
7.1C	-3.00	-4.80	-4.80	-3.00	-3.00	0.00				0.00								
7.1Ri	-3.00	-4.80	-4.80	-16.70	-0.34		-3.00	-3.00			-3.00	-3.00						
7.1R	-3.00	-4.80	-4.80		0.00		0.00				0.00							
7.1SI	-6.00	-6.00	-6.00	-9.00				0.00			0.00							
7.1Sr	-6.00	-6.00	-6.00	-6.00				0.00				0.00						
7.1B	-6.00	-3.00	-3.00	-3.00	-6.00	-6.00	-6.00	-6.00					0.00					

Figure 4-19 Foldown window

4.7 Diagnostics

When a system error occurs and the user is not in the Diagnostics page, the Euphonix logo and top-screen border flashes, alerting the user to inspect the Diagnostics page. Display the Diagnostics page by clicking the Euphonix logo at the bottom-left corner of the main Emix screen.

Press the reset button on the module, DSP card, or PC that shows the error. A dialog box appears requesting that you resynchronize the system. Click **Yes** and the system should function normally again.

Ctrl+Alt+F12 disables the diagnostics system warning.

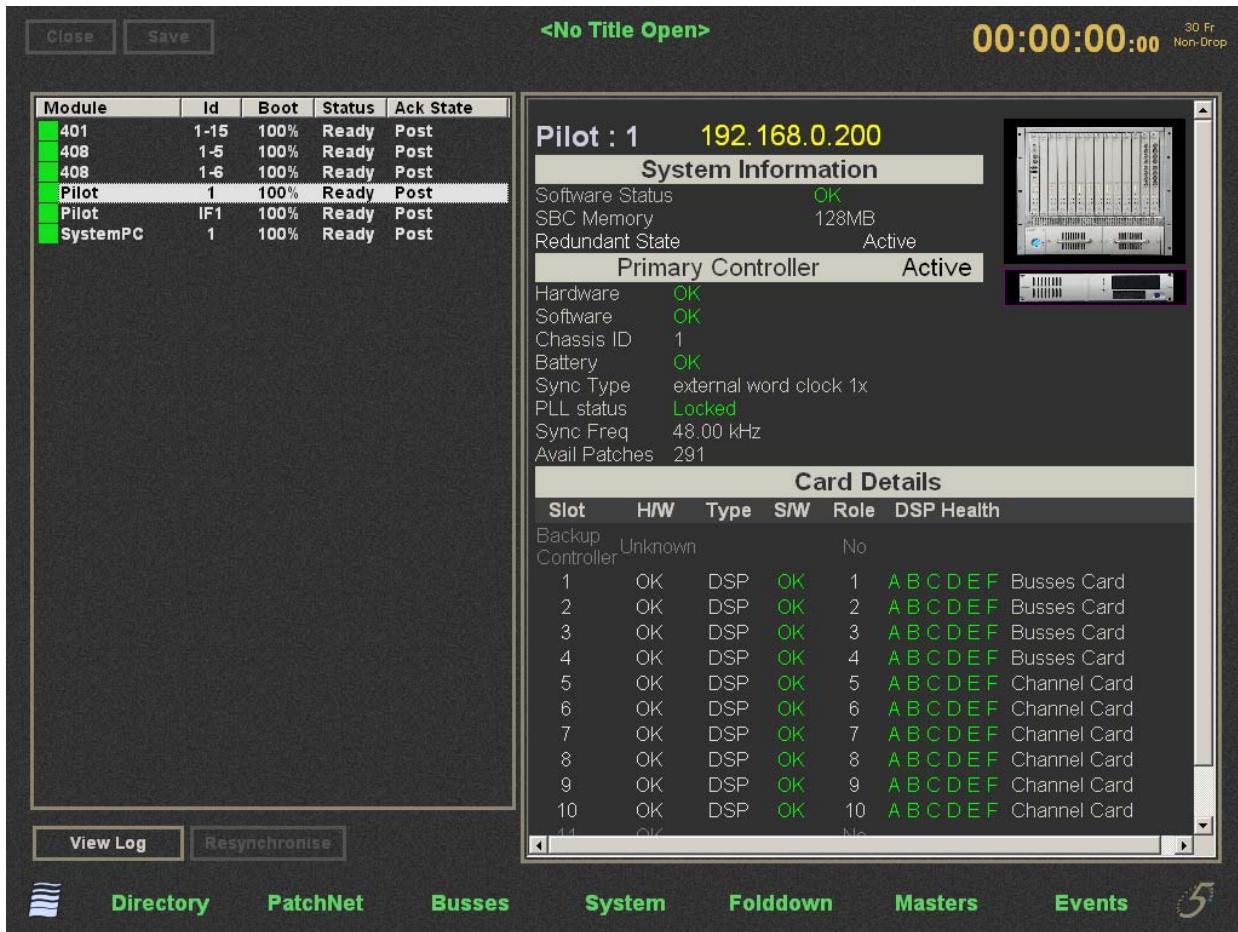


Figure 4-20 Diagnostics Window

4.8 Masters

See Chapter 7: *Busses and Bus Masters*.

4.9 Events

See Chapter 11: *GPI/O Event System*.

4.10 System 5 Logo

Clicking on the System 5 Logo in the lower right corner of the eMix screen will display software version information and shutdown options.

Chapter 5: CM401 Master Section

The CM401 Master Module (Figure 5-1) controls master functions for Monitors, Communications, Solo, and Meters. This chapter discusses each subject in detail.

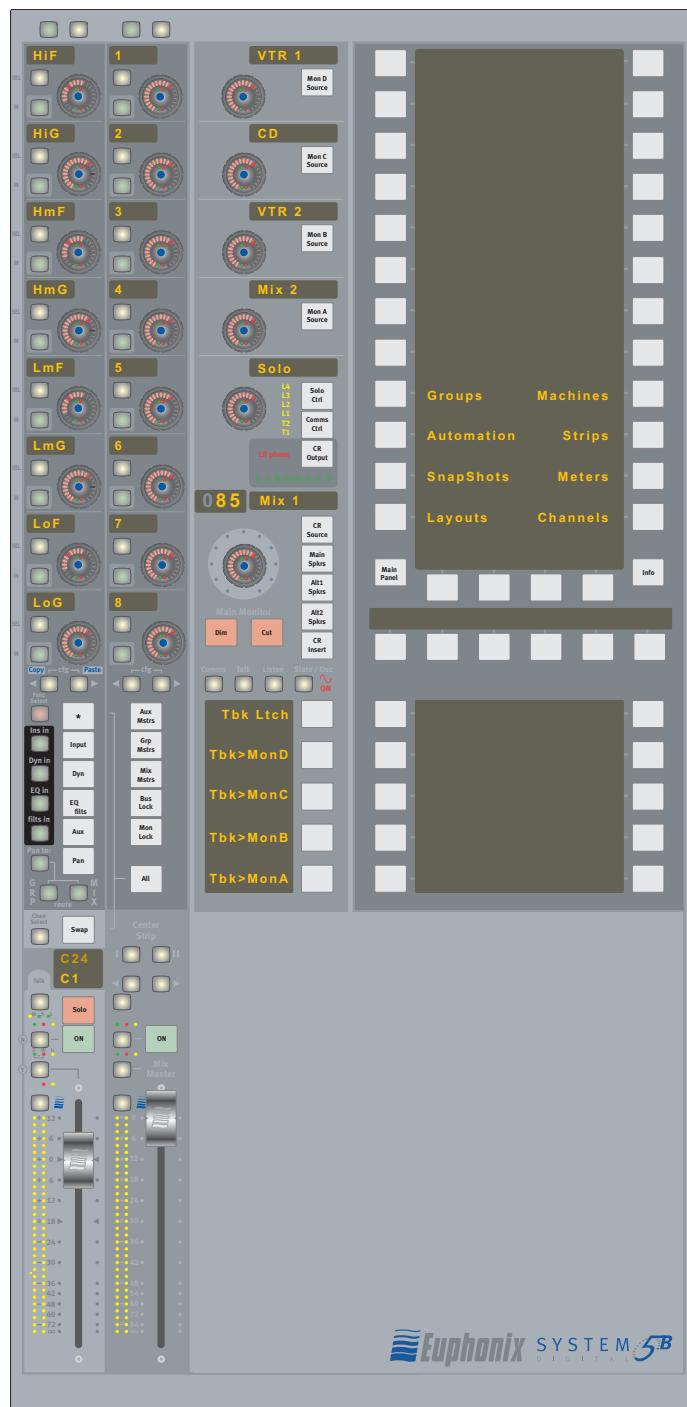


Figure 5-1 CM401 Master Module

5.1 Monitoring

The System 5-B monitor system accommodates multi format outputs up to 7.1 channels. There are seven monitor outputs (Figure 5-2):

Control Room:

- Main - 7.1 max
- Alt1 - 5.1 max
- Alt2 - stereo

Studio:

- Monitor A - 7.1 max
- Monitor B - stereo
- Monitor C - stereo
- Monitor D - stereo

Mon A, B, C, and D are used for SLS/Cue feeds.

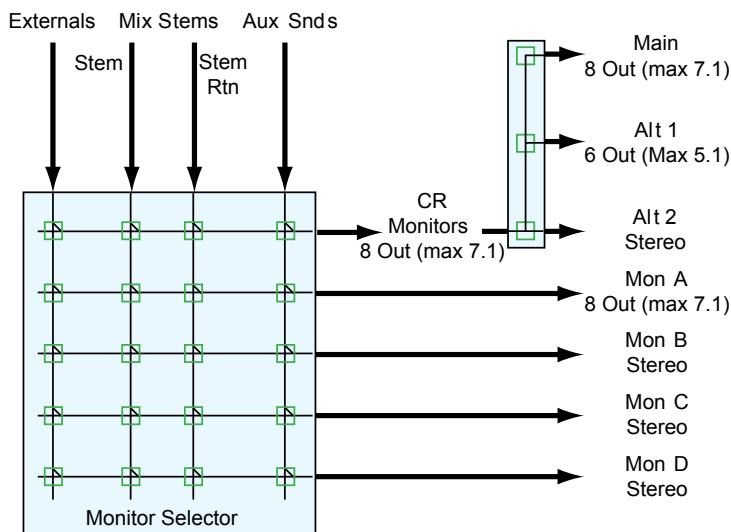


Figure 5-2 Monitoring Matrix

Source selection for the monitor output can either intercancel (only one source to a monitor output), or sum (multiple sources). The Control Room monitor outputs can be *folded down* from their multichannel formats (see *Folddown* on page 51).

NOTE: *Group bus outputs are normally monitored on the Strips but can be routed using external inputs and PatchNet if they require direct monitoring.*

5.1.1 Monitor Source Selection

The sources for Mon A–D and Control Room outputs are selected using the Panel Viewer. Press the **Mon A–D** or **CR Source** buttons to display available sources (Figure 5-3 shows the Mon D Source Panel).

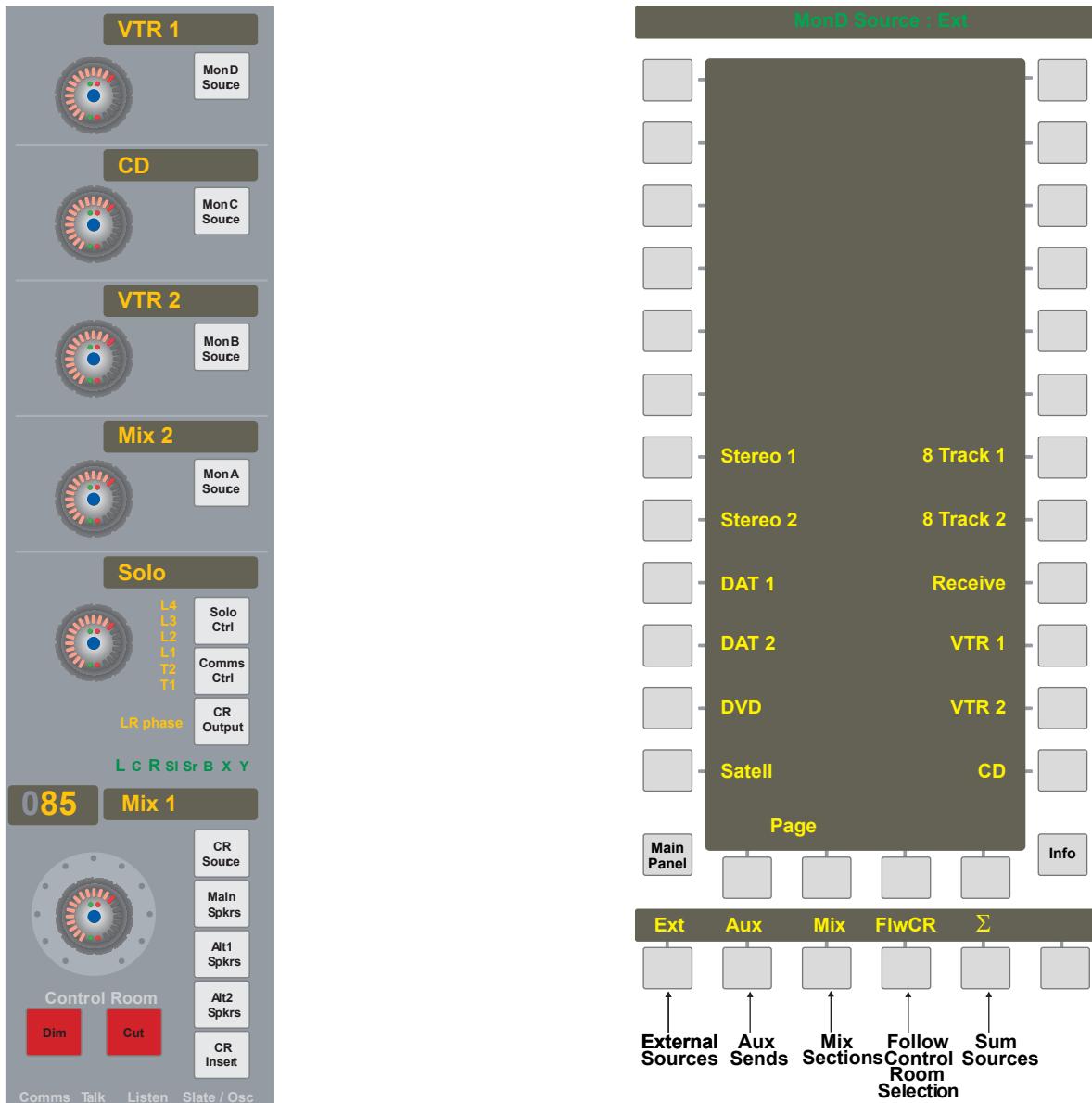


Figure 5-3 Monitor Controls and MonD Source Panel

Use the keys on the bottom of the Panel to select the type of source: External (CD, VTR, etc.), Aux Sends, or Main Sections. The current source type key lights and available sources within that type appear in the Panel. Press a key along the sides of the Panel to select a source. The active source key lights and the name appears in the LCD display above the **Mon A–D Source** button.

Sum or Intercancel

The Σ key is inactive (not lit) by default, which means that selecting a new source automatically cancels the previous one. When the Σ key is lit, multiple sources can be selected simultaneously. The Σ symbol appears to the left of the first source selected in the LCD display in the monitor controls. After selecting multiple sources, pressing the Σ key again (so it is not lit) *does not deselect these sources until a new source is explicitly selected.*

Follow Control Room Monitors

Activate the **FlwCR** key so the Mon A–D outputs follow the source selected for the Control Room monitors.

5.1.2 Main Section and Aux Send Format

Each Main section also has a return that allows Bus/Tape monitoring. The returns can be patched from the record machine's outputs using PatchNet (see *Main Bus Send/Return* on page 46). It is not possible to select a Main section and its return at the same time; they intercancel even in Summing mode.

Aux Sends appear in the Panel as mono or stereo pairs.

5.1.3 Control Room Monitor Controls

Press the **CR Output** key above the CR Source LCD to display the Control Room Output Panel (Figure 5-4).

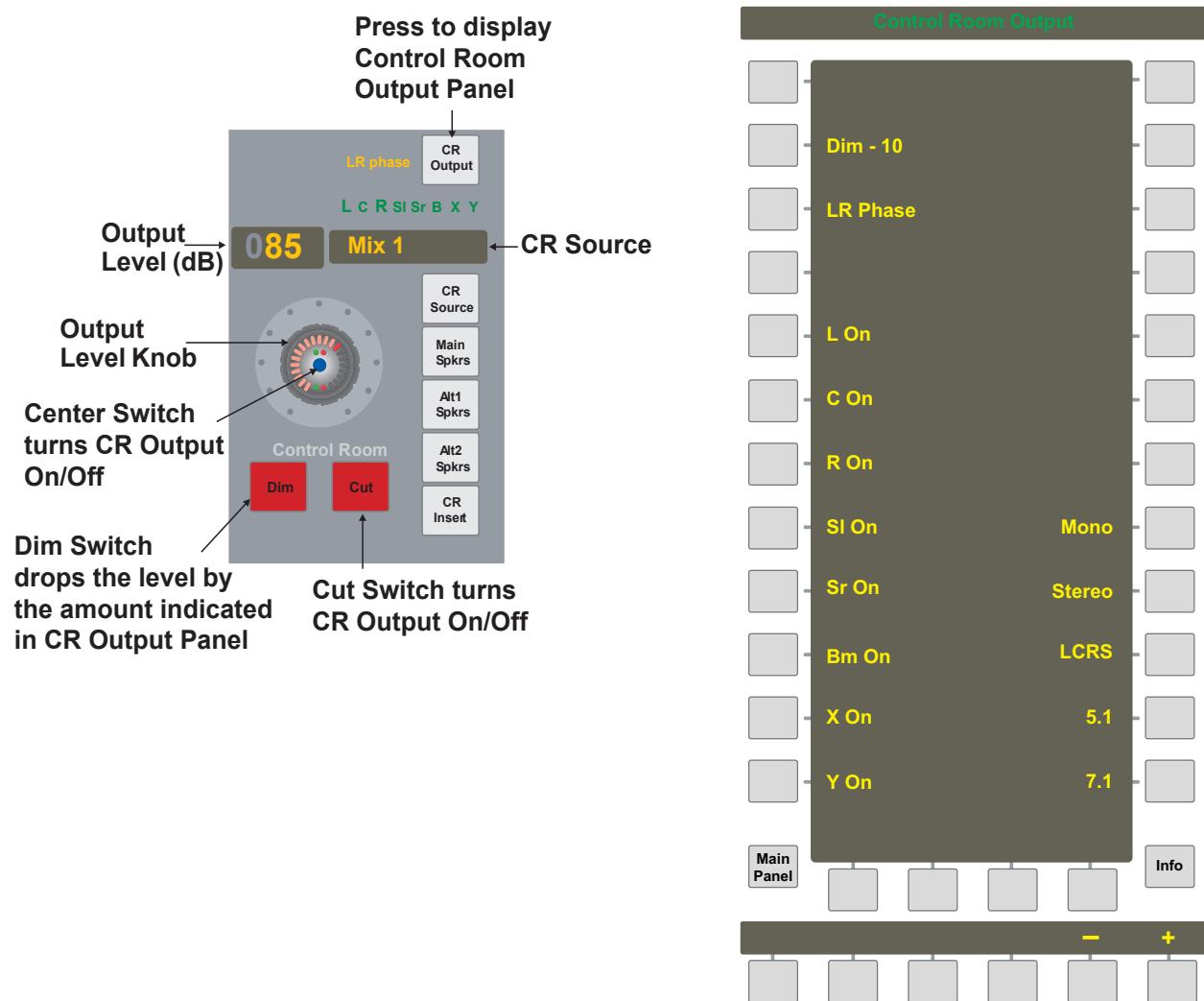


Figure 5-4 CR Output controls and Control Room Output Panel

Dim and Cut

The Dim level can be set in the Control Room Output Panel by pressing the **Dim** key on the panel viewer and using the **+/- soft keys**, or the output level knob, to adjust the level. This is the reduction in level (dB) that occurs when the **Dim** switch is active.

The Control Room Monitors may be switched off/on by pressing the output level knob's center switch or the **Cut** switch.

Monitors A–D may be switched off/on by pressing the output level knob's center switch; they are off when their output level knob's center LED is not lit.

Cut Individual CR Speakers

The Control Room speakers can be individually switched on and off. The **L**, **C**, **R**, **Sl**, **Sr**, **Bm**, **X** and **Y** keys in the Control Room Output Panel are lit when on. In addition, the LEDs above the CR Source LCD display light to show active speakers (see Figure 5-4).

Mon Lock

The **Mon Lock** key on the Bus Master Strip (Figure 7-1) disables the Control Room and Monitor levels. **Dim** and **Cut** always remain active.

Phase Reversal for Left and Right CR Speakers

The phase of the left Control Room speaker (Main, Alt1, Alt2) can be reversed by selecting the **LR Phase** key in the Control Room Output Panel for that output. The **LR Phase** key lights to indicate the left speaker's phase is reversed with respect to the right. The **LR Phase** LED to the left of the **CR Output** key also lights (see Figure 5-4).

CR Level

The Control Room speakers (Main, Alt1, Alt2) have a dedicated level knob and output level LCD display (see Figure 5-4). The knob LEDs also indicate the current level.

CR Speakers

There are three speaker outputs within the Control Room Monitors: Main (7.1), Alt1 (5.1) and Alt2 (stereo). The three switches below **CR Source** select between the three speakers; these switches are *after* the CR level, dim, and cut functions which affect all three speaker sets.

CR Format Foldown

The Main CR outputs may be folded down from their original format to one with fewer outputs using the keys on the right of the Control Room Output Panel (see Figure 5-4). The eMix software allows you to set foldown options (see *Folddown* on page 51).

Control Room Insert

This feature allows insertion of a Surround Matrix, equalizer, or compressor across the control room monitors. To activate, press the **CR Insert** switch at the bottom of the CR Output controls.

5.1.4 SLS/Cue Monitor Outputs

Mon A–D are usually used for SLS and Cue feeds. Each has its own level control and LCD display that shows the source and level when adjusted. The center knob switch turns the monitor on/off. These controls are shown on the left of Figure 5-3.

5.2 Communications

System 5-B's communication system includes:

- Two talkback microphone inputs (one mic included).
Each input has 111 dB of gain, phantom power, and a compressor. The talkback mics can be mounted anywhere but normally Tbk1 is mounted near the engineer and Tbk2 near the client. Talkback can be routed to Mon A–D, the Aux busses and the Main sections (via the Slate function). Tbk2 shares the same routing as Tbk1 when it is turned on. Talkback can be remotely triggered to Mon A–D.
- Four listenback mic inputs.
Each input has phantom power and compressor. They can be routed to the monitors and have individual level controls.
- Oscillator with Slate facilities.
The oscillator has four fixed frequencies at 100 Hz, 440 Hz, 1 kHz, 10 kHz, and a user-selectable frequency. The oscillator can also generate pink or white noise. The oscillator can be routed to the Group, Aux, or Main sections, or to all busses simultaneously. The Slate function combines Tbk1 and Tbk2 with a user-definable tone to identify takes.

NOTE: *The Listenback mics are routed directly within the Monitor Interface (MC524) so they do not appear in PatchNet.*

Access the communications facilities by pressing the **Comms Ctrl** key in the Solo Ctrl section to display the Comms:Talkback Panel (left of Figure 5-5). The bottom of the Panel has **Talk**, **Lsn**, and **OscSlt** keys to display Talkback (shown), Listenback (page 63), and Oscillator/Slate Panels (page 64), respectively. The Comms:Talkback Panel has an **Aux** key at bottom-right to set the talkback settings for the Aux busses. When displaying the Comms:Talkback:Aux Panel (right of Figure 5-5), this key changes to **Mons**, which switches back to the panel shown in the left of Figure 5-5.

5.2.1 Talkback

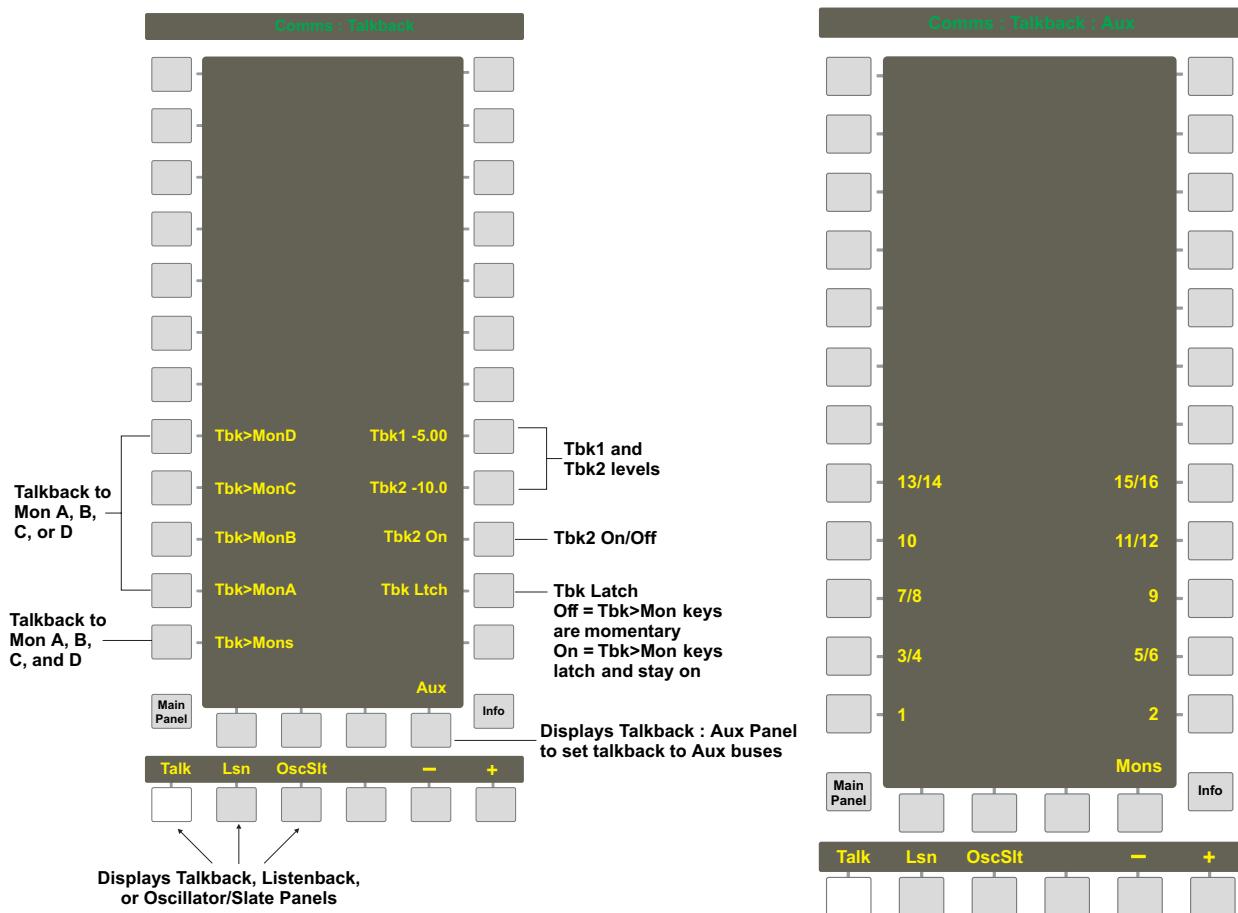


Figure 5-5 Comms:Talkback Panels

Monitors

Tbk1 and Tbk2 (if **Tbk2 On** is lit) can be routed to Mon A–D by pressing the **Tbk>MonX** keys on the left of the Comms:Talkback Panel. These keys are momentary unless **Tbk Ltch** is active, in which case they can be toggled on/off each time they are pressed. More than one monitor can be active by pressing multiple keys and all can be active by pressing the **Tbk>Mons** key.

Talkback is not routed to the Control Room speakers but the Main CR speaker and the monitors receiving talkback are dimmed by the level set for the **DIM** key (see *Dim and Cut* on page 59).

Set the Tbk1 level by activating the **Tbk1 xx.x** key and using the **+/- soft keys** to adjust the level. Use the same process for Tbk2.

Aux Busses

Press the **Aux** key at bottom right of the Comms:Talkback Panel to display the Aux busses. The same rules apply to the Aux Busses as monitors. Select the Aux Busses (single or pairs) to route the talkback signals. They latch or are momentary based on the **Tbk Ltch** setting and their levels are set on the Mons page.

5.2.2 Listenback

Press the **Lsn** key at the bottom of the Comms:Talkback Panel to display the Comms:Listenback Panel (Figure 5-6).

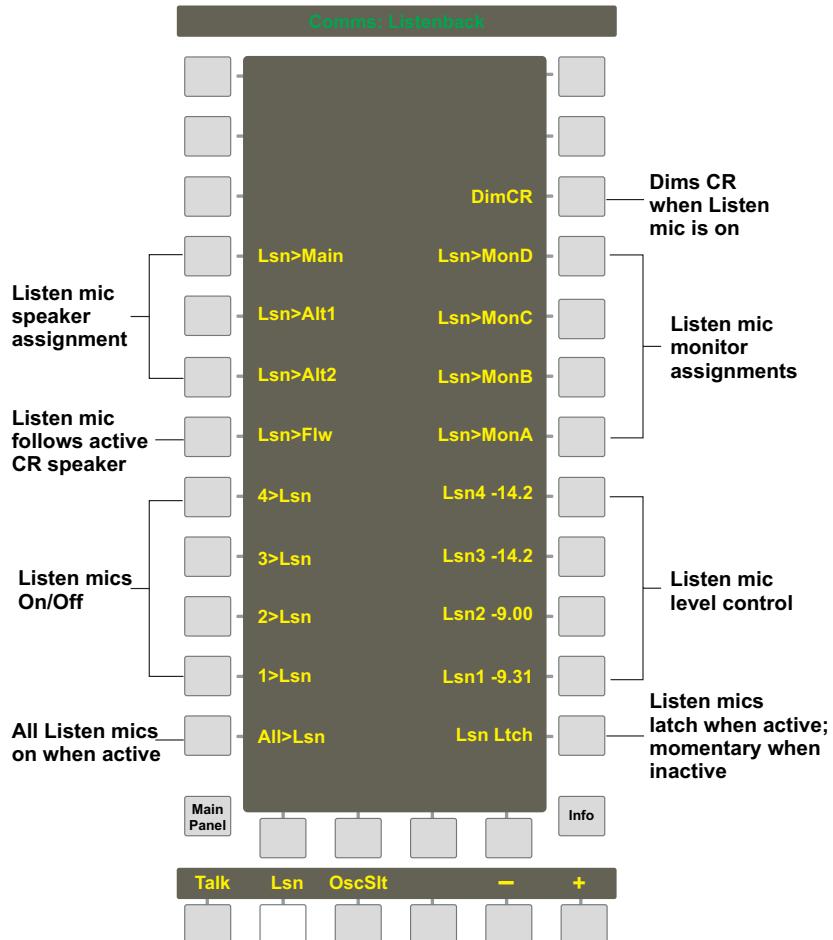


Figure 5-6 Comms:Listenback Panel

The listen mics can feed any combination of the CR Main, Alt1, Alt2, or Mon A–D speakers by activating their keys on the top half of the Panel. Activate **Lsn>Flw** to route the listen mics to the active CR Speaker.

Activate the **DimCR** key to dim the CR Speaker by the level set for the **DIM** key when the listen mics are on (see *Dim and Cut* on page 59).

Turn the listen mics on/off by pressing the **1>Lsn..4>Lsn** keys on the left of the Panel. Turn all listen mics on/off by pressing the **All>Lsn** key. The on/off keys are momentary unless **Lsn Ltch** is active.

Set the listen mic levels by pressing one of the **Lsn4..Lsn1 xx.x** keys on the right of the Panel and using the **+/- soft keys** to set the level.

5.2.3 Oscillator/Slate

Oscillator

Press the **OscSlt** key at the bottom of the Comms:Talkback Panel to display the Comms:Slate/Osc Panel (Figure 5-7).

Turn the oscillator on by activating the **Osc>On** key. Select the oscillator type by pressing the **Osc>Sine**, **Osc>White**, or **Osc>Pink** keys on the top-right of the Panel. These keys intercancel so only one type can be selected at a time.

Select the oscillator frequency by pressing the **Osc>100Hz**, **Osc>440Hz**, **Osc>1kHz**, or **Osc>10kHz** keys on the left of the Panel. In addition, there is a user-selectable frequency key below the **Osc>10kHz** key. Activate this key and use the **+/- soft keys** to set the frequency (20 Hz to 21 kHz). All of the frequency keys intercancel.

Set the oscillator level by activating the **Osc>xx.x** key (above **Osc>Grp**) and using the **+/- soft keys**.

Slate

Set the Slate frequency by activating the **Slt>xx.xH** key and using the **+/- soft keys**.

Set the Slate level by activating the **Slt>xx.x** key and using the **+/- soft keys**.

Activate the **Slt>Grp** and **Slt>Main** keys to route the Slate to Group and/or Main sections, respectively. Activate the **Slt>ALL** key to route the Slate to Group and Main sections.

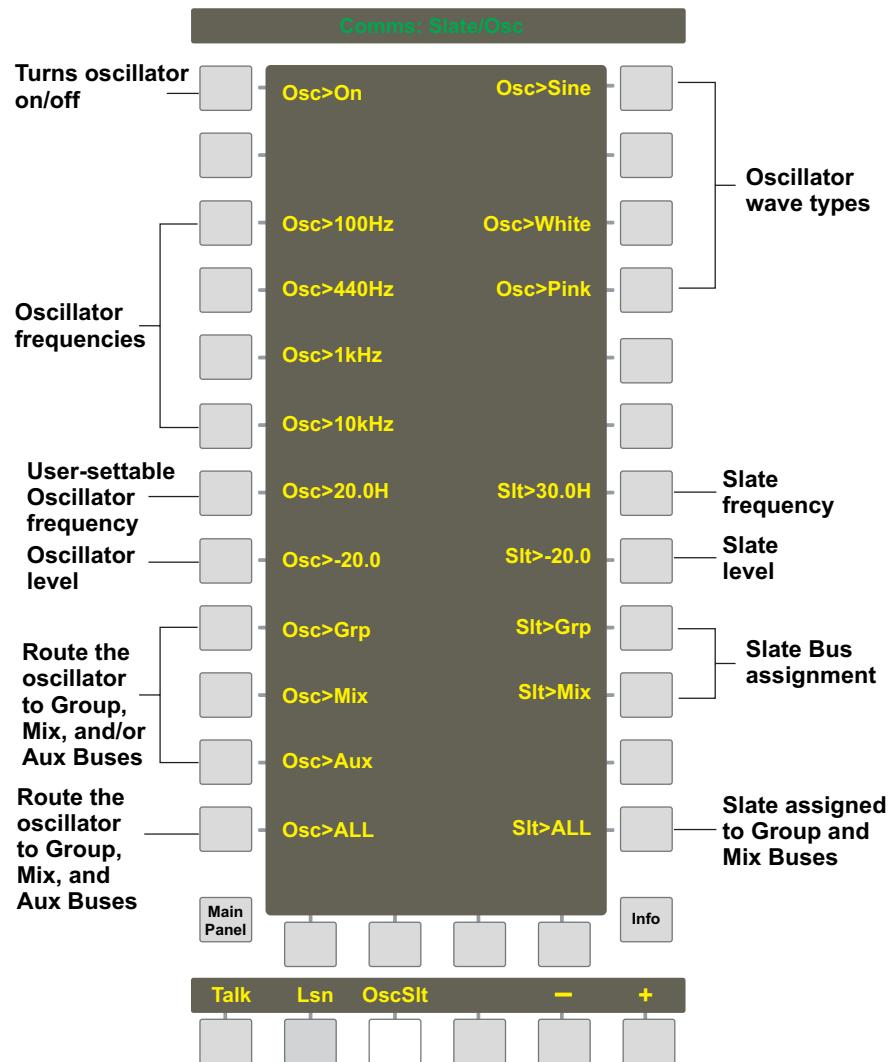


Figure 5-7 Comms:Slate/Osc Panel

5.2.4 Quick Access Communications Panels

The Quick Access Panel, located below the CR Level area, provides easy, fast access to the most commonly used Communications parameters without using the Panel Viewer. Use the buttons above the panel to display Quick Access Panels for general Communications, Talkback, Listen, and Slate/Osc (Figure 5-8).

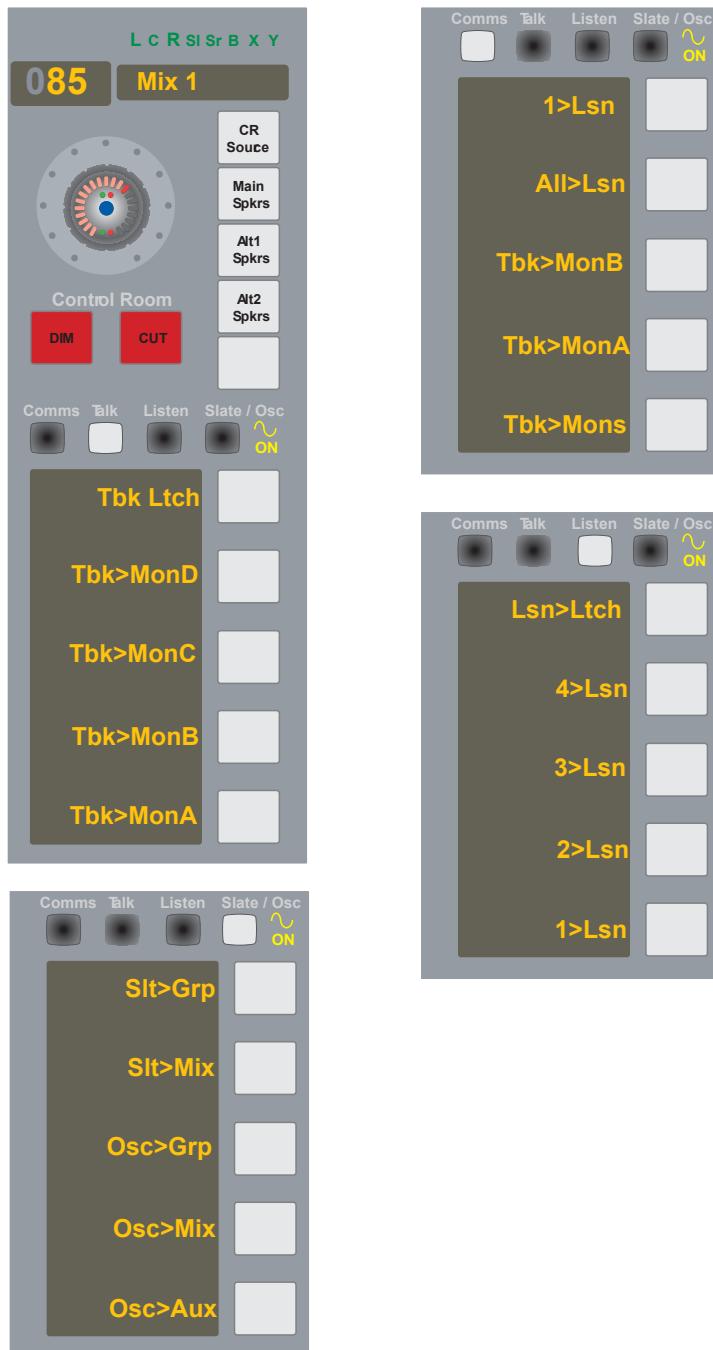


Figure 5-8 Quick Access Communication Panels

5.3 Solo

System 5-B has an extensive solo control system that is accessed from the center section. Press the **Solo Ctrl** switch in the master Solo section to display the **Solo Control Panel**.

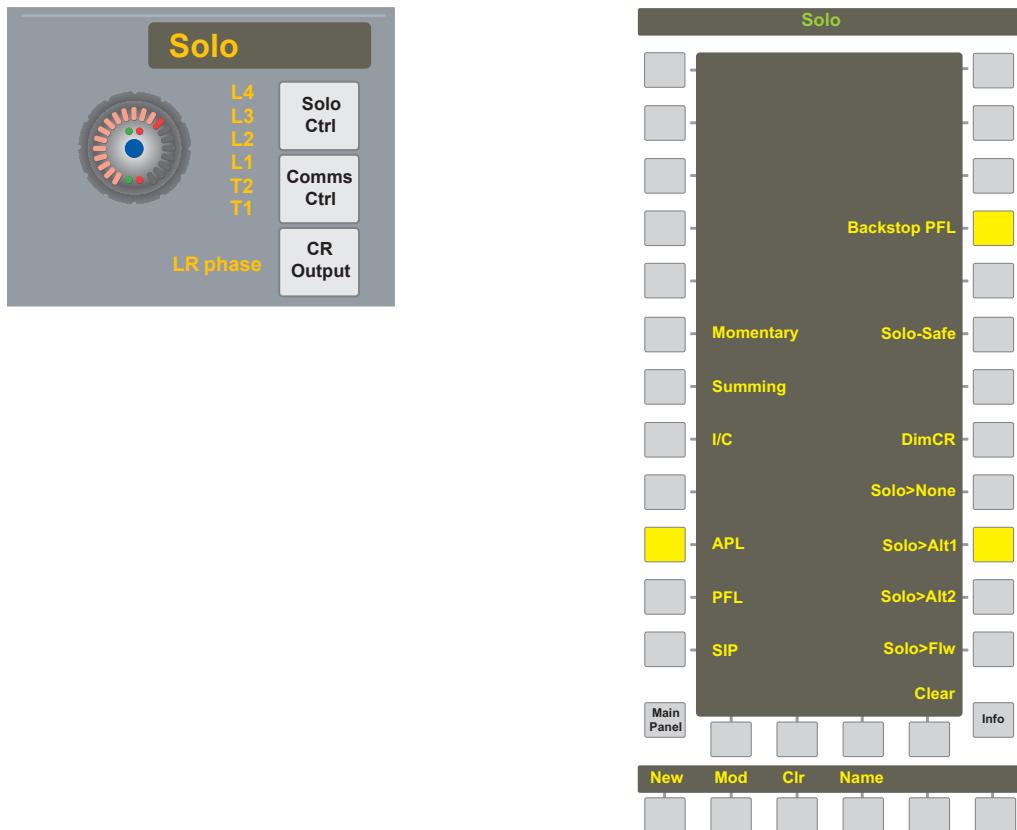


Figure 5-9 Master Solo section (top-left) and Solo Control Panel

5.3.1 Solo Mode

The three Solo modes can be selected by pressing their respective switches in the Solo Control Panel. Selecting one mode deselects the previous mode.

APL (After-Pan Listen): Signal is post-fader and pan (stereo)

PFL (Pre-Fader Listen): Signal is pre-fader in mono

SIP (Solo-In-Place): Allows soloed channels through to the main busses. Mutes all channels not soloed but not channels designated as **Solo-Safe** (page 69). This mode allows monitoring soloed channels with panning and effects if the effects returns have been designated Solo-Safe. We do not recommend this destructive solo mode for live broadcast or for recording a mix or dub.

5.3.2 Solo Level

The **Solo** knob controls the solo level (APL and PFL modes) sent to the speakers or the Solo Output in PatchNet. The level is indicated on the LEDs surrounding the knob. The LED in the center of the knob flashes when a channel is soloed.

5.3.3 Solo Clear

All solo channels can be cleared using either of these methods:

- Press the switch in the center of the **Solo** knob.
- Press the **Clear** key on the bottom-right of the **Solo Control Panel**.

5.3.4 Intercancel, Momentary, and Sum

The **Solo** keys on the Strips *sum* by default: the **Sum** key is illuminated when the **Solo Control Panel** is first displayed. This means that multiple channels can be soloed by pressing additional Solo keys. Soloed channels must then be explicitly cleared. There are two other options available in the **Solo Control Panel** that control the **Solo** key:

- **Momentary**: The Solo key must be held down but multiple channels can be simultaneously active.
- **Intercancel**: Pressing each new **Solo** key clears the last solo channel and activates the new one.

5.3.5 Solo Speaker Selection

The APL and PFL solo signals can be routed to the following speakers by activating their respective keys in the **Solo Control Panel**:

- **Solo>None**: This still routes signal to the MC524's cue speaker outputs. This is an important feature for broadcasters.
- **Solo>Alt1**: The Solo signal is sent to the Alt1 speaker.
- **Solo>Alt2**: The Solo signal is sent to the Alt2 speaker.
- **Solo>Flw**: The Solo signal follows the active control room speaker selection (Main, Alt1, or Alt2).

5.3.6 Solo Speaker Dim

In APL and PFL modes, the speakers not fed by the Solo signal can be dimmed. Press the **DimCR** key in the **Solo Control Panel**.

5.3.7 Solo-Safe

Solo-Safe is used with the SIP mode and has no effect in APL or PFL modes. SIP mode effectively mutes all channels except the soloed channel. Designating a channel Solo-Safe allows it through to the main busses even when another signal is soloed. Solo signals can be heard with effects if the effects returns are designated Solo-Safe.

1. Press the **Solo-Safe** key in the **Solo Control Panel**.
2. Press the **Chan Select** key of the channel to make Solo-Safe.
The **Chan Select** key flashes to show it has been made Solo-Safe. The channel's **Solo** key also lights dimly when in Solo-safe mode.
3. Press additional **Chan Select** keys.
4. Press the Solo-Safe key again or another **Solo Control Panel** key to exit the mode.

5.3.8 Backstop PFL

The System 5-B's faders have a backstop PFL switch past the bottom of their travel. Press **Solo Ctrl** on the Center Section to open the **Solo Control Panel** and select **Backstop PFL** to enable this feature. Pull and hold a fader past the bottom of its travel to route the signal's PFL level to the Solo bus. Release the fader to cancel its routing to the Solo bus. **Backstop PFL** does not affect normal solo operations and can be used on Control Group and Multi Format master faders to PFL a group of channels. Deactivate **Backstop PFL** in the Solo Control Panel to cancel the mode.

5.4 Meters

The System 5-B meters are displayed on the TFT screen at the top of each Strip. Each Strip's meter can be set independently and can measure:

- **Channel:** the fader, Swap, Main, or any channel, even one not assigned to that Strip. There is an option to display two meters to track different information. When displaying one meter, the dynamics gain reduction is shown to the right of the channel meter (Figure 5-10).
- **Group, Main, Aux:** Any Group, Main, or Aux Bus.

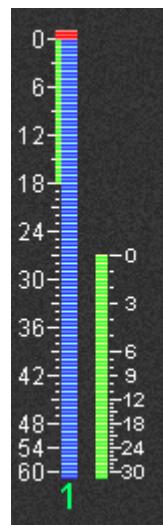


Figure 5-10 Channel meter with dynamics gain reduction meter on right

5.4.1 Meters Panel

From the Main Panel, press the **Meters** switch to display the **Meter Presets Panel** (left of Figure 5-11). Twenty four meter presets can be stored and recalled via the **Meter Presets Panel**. Before creating presets, configure each Strip's meters.

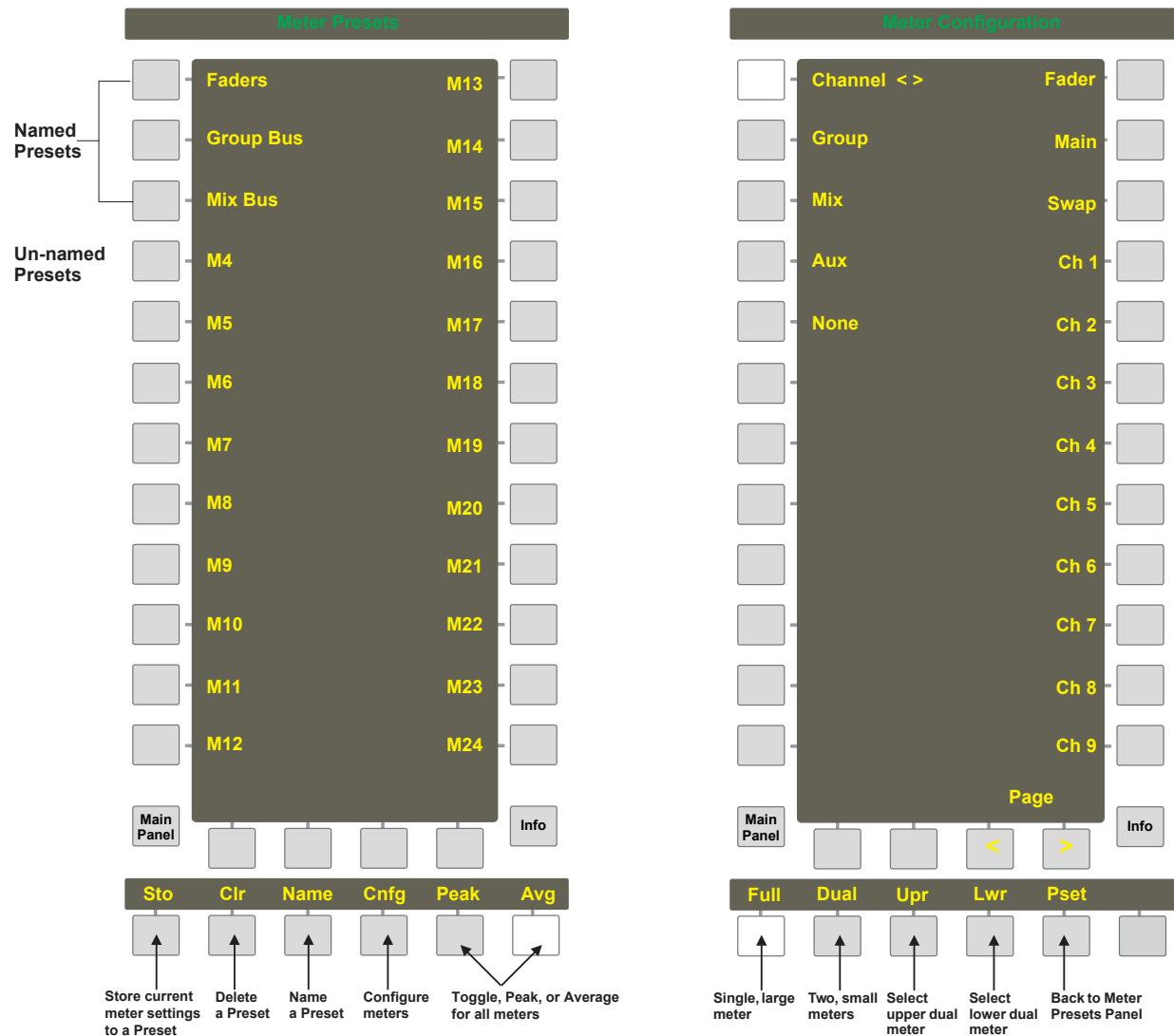


Figure 5-11 Meter Presets and Meter Configuration Panels

Meter Configuration

Press the **Cnfg** key at the bottom of the **Meter Presets Panel**. The **Meter Configuration Panel** appears (right of Figure 5-11). By default, the **Full** key (bottom-left) is lit, which selects one large meter; the **Channel** key (top-left) is also lit, which displays the Channel options along the right side of the Panel. The double arrows (depicted opposite **Channel** in Figure 5-11) show what the right-side options pertain to (i.e., press **Group** to display Grp 1, Grp 2, etc. along the right side and the arrows appear opposite **Group**).

Each Strip can have a different meter configuration but it is also easy to assign the same configuration to consecutive Strips (with automatic incrementing).

To select one meter:

1. While displaying the **Meter Configuration Panel**, press Strip 1's **Wave** key.
2. Press the **Full** key from the bottom row to select one large meter.
3. Select **Channel** as the signal type for Strip 1's meter from the options on the left side of the Meter Configuration Panel.
The right side of Figure 5-11 shows the relevant **Channel** options. Group, Main, and Aux have different options.
4. Select **Fader**, **Main**, **Swap**, or **Ch #** to assign the signal to the meter.

Fader: Meter measures whatever the fader controls (i.e., the active Swap/Main channel). Despite the name, the signal is measured pre-fader.

Main: Meter measures the Main channel even when Swap is active.

Swap: Meter measures the Swap channel even when Main is active.

Ch #: Meter measures the assigned channel even if it is not assigned to that Strip.

NOTE: It is most common to meter the Fader, Main, or Swap signals. The TFT meter and fader meter follow the meter source point as set in the signal path order (see page 115).

To select dual meters:

1. While displaying the **Meter Configuration Panel**, press Strip 1's **Wave** key.
2. Press the **Dual** key from the bottom row to select two, small meters.

The **Dual** and **Lwr** keys light.

3. Press the **Channel** key on the left side.
4. Press the **Fader** key on the right.

The lower meter now measures the signal applied to Strip 1's fader.

5. Press the **Upr** key to set the upper meter's options.
6. Press the **Group** key on the left side.

The double arrows move down to appear opposite **Group**. The options change along the right side to Grp 1, Grp 2, etc.

7. Press the **Grp 1** key on the right side.

Strip 1's upper meter now measures the Group 1 Bus.

To select the same meter configuration for multiple Strips, press another Strip's **Wave** key after configuring the first Strip. Because each meter's signal is automatically incremented by one, set the lowest numbered Strip first and then set additional Strips consecutively. For the dual meter example above, pressing Strip 2's **Wave** key assigns Group Bus 2 to the upper meter and Strip 2's fader to the bottom meter. If Strip 3's **Wave** key was pressed instead of Strip 2, Group Bus 2 would still be assigned to Strip 3's upper meter.

5.4.2 Master Section Meters

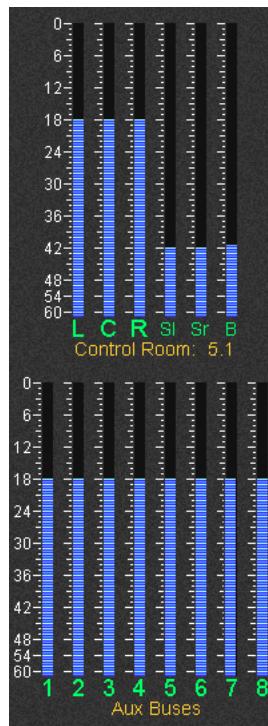


Figure 5-12 Master section meters showing 5.1-channel CR and Aux Busses 1–8

The TFT screen above the center section shows two meters, one above another. The upper meter automatically shows the selected monitor output format. For example, if the Control Room is monitoring Main Bus A and it is a 5.1-channel format, the meter automatically displays 5.1 channels.

The lower meter automatically displays whatever is currently assigned to the Bus Master Strip: Aux, Main, or Group Masters, Mon A, B, C, D, or Solo Master. The meter displays the eight meters corresponding to the Bus Master knobset. If there are more than eight masters, use the **◀▶** keys on the Bus Master Strip to change pages. For example, if Group Bus Masters 9–16 are on the knobset, the meters display these automatically. Press the **Mon A–D Source** or the **Solo Ctrl** switches to meter these signals on the lower meter.

Chapter 6: CM402 Center Section

The CM402 Center Section module (Figure 6-1) is located to the left of the CM401 Master Section (which contains the Center Strip). The purpose of the CM402 is to expand access to Center Strip channel's functions so they are more readily available. It includes the following functional sections, from top to bottom:

- Bus Routing Panel
 - Bus routing for the Center Strip's channel.
 - See *Bus Routing Panel* on page 80.
- Aux, Input, and Filters knobs with select panel
 - The Select Panel determines which functions of the Center Strip's channel are displayed on the knobs.
- Dynamics and EQ knobs
 - The Center Strip channel's dynamics and EQ are always displayed on these knobs.
- Channel Select Panel
 - Assigns a channel to the Center Strip.
- Eight assignable Strip faders
 - Although traditionally used for Control Groups, any channel can be assigned to them using the same techniques to assign a channel to a Strip on the CM408.

Any channel on the console can be displayed on the Center Strip by pressing its **Wave** key. The Channel Select Panel can also assign channels to the Center Strip.

Once a channel has been assigned to the Center Strip,

- reassigning the Swap or Main channels on the original Strip is not reflected in the Center Strip.
- reassigning the Swap or Main channels on the Center Strip is not reflected in the original Strip.
- the original Strip can still control all of its functions.

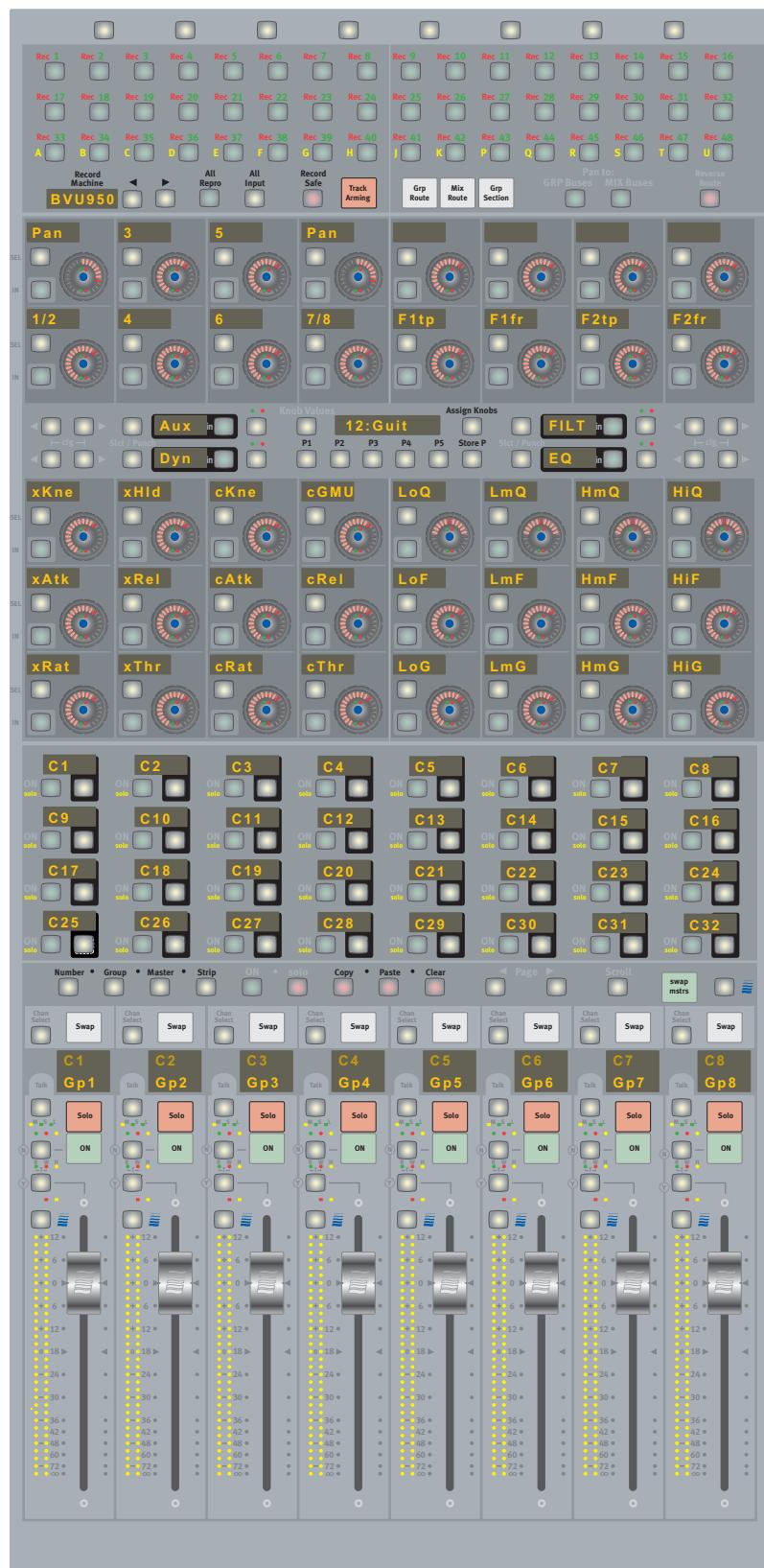


Figure 6-1 CM402 Center Section

6.1 Channel Select Panel



Figure 6-2 Channel Select Panel

The Channel Select Panel provides easy access to any channel or Control Group in the System 5-B configuration. It defaults to displaying the first 32 channels, each with a four-character LCD display, **ON/Solo**, and **Channel Select** keys.

- The **Page** keys display additional channels in groups of 32. If the **Scroll** key is lit, the **Page** keys display one new row of channels (eight) instead of 32.
- The right key beneath each channel's LCD display assigns that channel or Control Group to the Center Strip, replacing the channel in the active layer (Swap or Main). This key functions identically to a CM408 Strip's **Wave** key.
- The **Number** key toggles between displaying the channel or Control Group number (key is lit) and the name (key not lit).
- The **Group** key toggles between displaying channels (key not lit) and Control Groups (key is lit).

The global **ON** and **Solo** keys on the bottom of the panel determine whether the left key on each channel's controls performs an On/Off or Solo function. The **ON** and **Solo** keys cannot be lit simultaneously and intercancel:

- If **ON** is lit, the key turns the Control Group or Channel On/Off.
- If **Solo** is lit, the key Solos the Control Group or Channel.
- If both are unlit, the key has no effect.

NOTE: The **Wave** key at the far right of the Channel Select Panel is not functional.

6.2 Knobset Panels

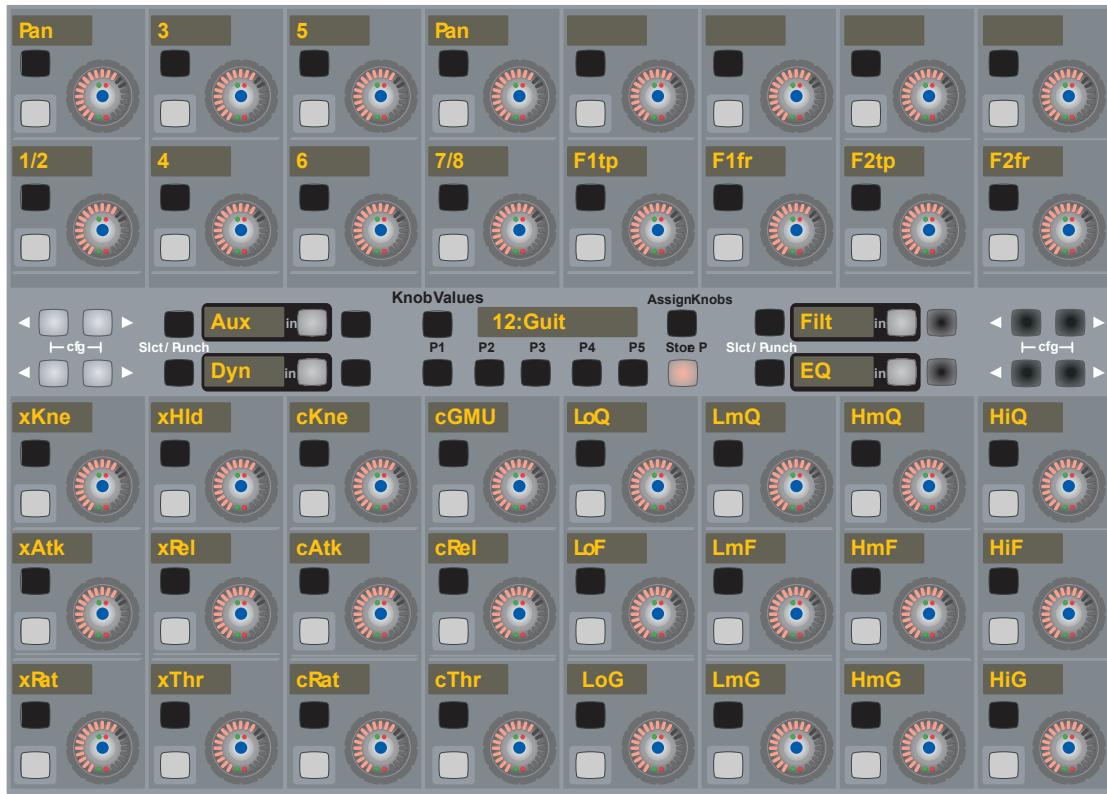


Figure 6-3 Center Panel knobsets

The Center Section's knobsets extend access to the Center Strip's functions. The two panels of 16 (4x4) knobs above the Channel Select Panel are dedicated to dynamics (left) and EQ (right). The two panels of eight (2x4) knobs above the Knobset Control Panel display different combinations of Aux, Input, and Filters depending on what is pre-selected from the Knobset Control Panel.

6.2.1 Knobset Control Panel

The Knobset Control Panel configures the knobs above the panel and which pages of Dynamics and EQ appear below it. The Input and Aux functions have configuration pages which can be accessed by pressing both **cfg** **◀▶** keys simultaneously (see Section 8.3 - *Channel Processing Functions* for details about the configuration pages). The LCD display in the center of the panel shows the current Center Strip channel.

**Figure 6-4** Knobset Control Panel

The **Knob Values** key toggles between showing the parameter name in each knob's LCD display (unlit) and the parameter value (lit). The LCD always displays the value when the knob is adjusted but reverts to the name unless **Knob Values** is lit.

The five Preset keys configure the two panels of eight knobs above the Knobset Control Panel. The current preset key remains lit and the top two (right and left) LCD displays show the selected functions. The bottom two LCD displays are fixed at Dynamics and EQ.

Table 6-1 Center Panel Knobset Presets

Preset #	Left	Right
1	Aux	Filters
2	Aux	Input
3	Input	Filters
4	Aux	Aux
5	Input	Input

The **Slt/Punch** switch selects it for inclusion when a Snapshot is taken. The **In** key switches the function In (lit) and Out (unlit). The switch to the right of the **In** key is the **Select/Punch** switch for the **In** key.

All knobset functions and displays are discussed in Section 8.3 - *Channel Processing Functions*.

NOTE: The **Store P** and **Assign Knobs** switches are not currently operational.

6.3 Bus Routing Panel



Figure 6-5 Bus Routing Panel

This panel shows the Group and Main Bus routing for channels assigned to the Center Strip. The **Grp Route**, **Main Route**, and **Grp Section** switches along the bottom of the panel determine the information being displayed and controlled. These switches intercancel: only one can be lit and active at a time. The **Pan To: GRP Busses** and **MAIN Busses** keys allow panning to the Group and Main busses (lit) or disables panning (unlit).

NOTE: *The Reverse Route switch is not currently operational.*

6.3.1 Grp Route

When the **Grp Route** key is lit, all 48 switches indicate Group Bus routing. The green number LEDs light to indicate the available busses. The switches light to show that the Center Strip channel is routed to that Group Bus.

6.3.2 Main Route

When the **Main Route** key is lit, all 48 switches indicate Main Bus routing. The green number LEDs light to indicate the available busses. The switches light to show that the Center Strip channel is routed to that Main Bus.

6.3.3 Grp Section

This is the default mode of operation. The top two rows indicate Group Bus routing and the bottom row indicates Main Bus routing.

Chapter 7: Busses and Bus Masters

7.1 Introduction to System 5-B Busses

The number of processing cards in the DF64 digital frames and the Mixer Model determine the total number of busses and channels available in a System 5-B configuration. Since there are a finite number of signal paths, more channels = less busses and vice versa. See *Mixer Model* on page 50 for a complete discussion of these system resource issues.

The System 5-B has four bus types: Main, Group, Aux, and Solo.

Main Busses

Main Busses can be configured in up to 16 Main Sections. Each Main Section can have between one and eight individual busses (i.e., a stereo pair = two individual busses and an LCRS set = four individual busses) configured to any format. Main Busses also have playback returns; Aux and Group busses do not.

Group Busses

Group busses are used to route channels to multitrack recorders, DAWs, mix-minus feeds, and sub-groups. Group Busses can be configured to any format but are usually configured as odd/even stereo pairs. With **Pan to Group** switched out, they act as individual mono busses.

Auxiliary Sends

Aux sends are used for effects, foldback, and mix-minus feeds. Aux sends can be configured as mono or stereo pairs and can be pre- or post-fader.

Solo Busses

The Solo bus is always configured as a stereo bus. After-Pan Listen (APL) and Pre-Fader Listen (PFL) route signals to the Solo bus. Each Strip's fader also has a Solo Backstop PFL function: move and hold the fader past the bottom of its travel to activate the Backstop PFL Solo mode (see *Backstop PFL* on page 99). Solo In Place (SIP) is a destructive Solo mode and does not use the Solo bus. See *Solo Mode* on page 67 for more information on SIP.

7.2 Bus Master Functions

The Bus Master Strip has eight knobs and five function keys to control all Bus Master functions.

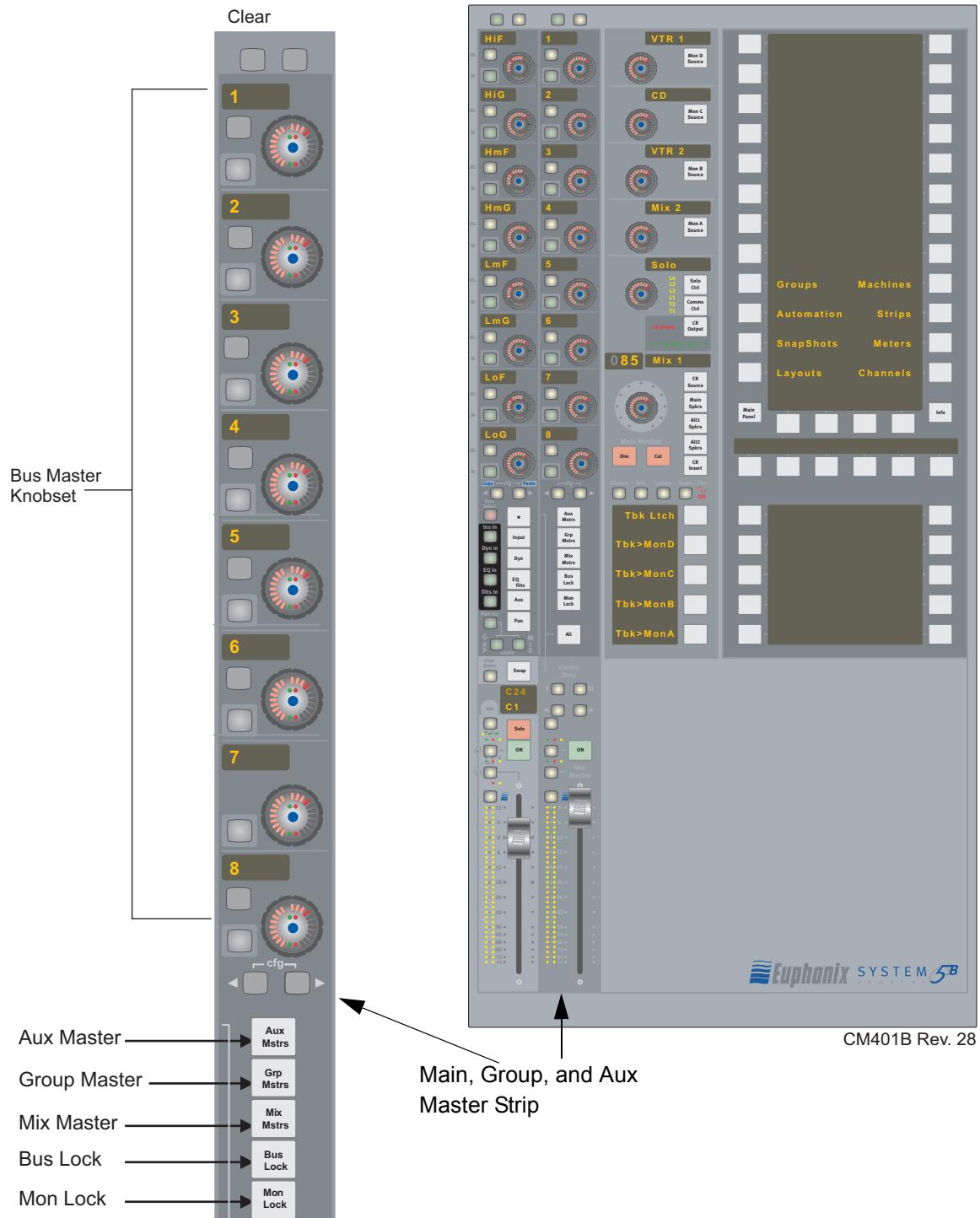


Figure 7-1 CM401 Center Section with Bus Master Strip

7.2.1 Aux, Grp, and Main Masters

Press the **Aux Mstrs**, **Grp Mstrs**, or **Main Mstrs** keys (**Figure 7-1**) to display the Aux Bus, Group Bus, or Main Bus functions, respectively, on the Bus Master knobset.

7.2.2 Bus Lock

The **Bus Lock** key disables the following functions when activated: Bus Levels (Main Master, Master Trims, and Leg Trims), Bus Inserts, and Bus On/Off switches.

While these functions are disabled, their values may still be interrogated.

7.2.3 Mon Lock

The **Mon Lock** key disables adjustment of the Control Room Monitor levels. **Dim** and **Cut** always remain active. See *Monitoring* on page 56 for more information on monitor controls.

7.2.4 All Key

The **All** key sets all strips to All Mode (see page 99).

7.2.5 Main Bus

Press the **Main Mstrs** key to bring the main bus sections onto the Bus Master knobset. The Master Fader controls the overall level of all Main sections. Each main section has its own master level control and trim controls for individual Main busses in its pre-selected format (see *Busses* on page 48 to see how to set the format). Relative levels are maintained when adjusting the Main Bus Master or Main section levels until a maximum or minimum value is reached.

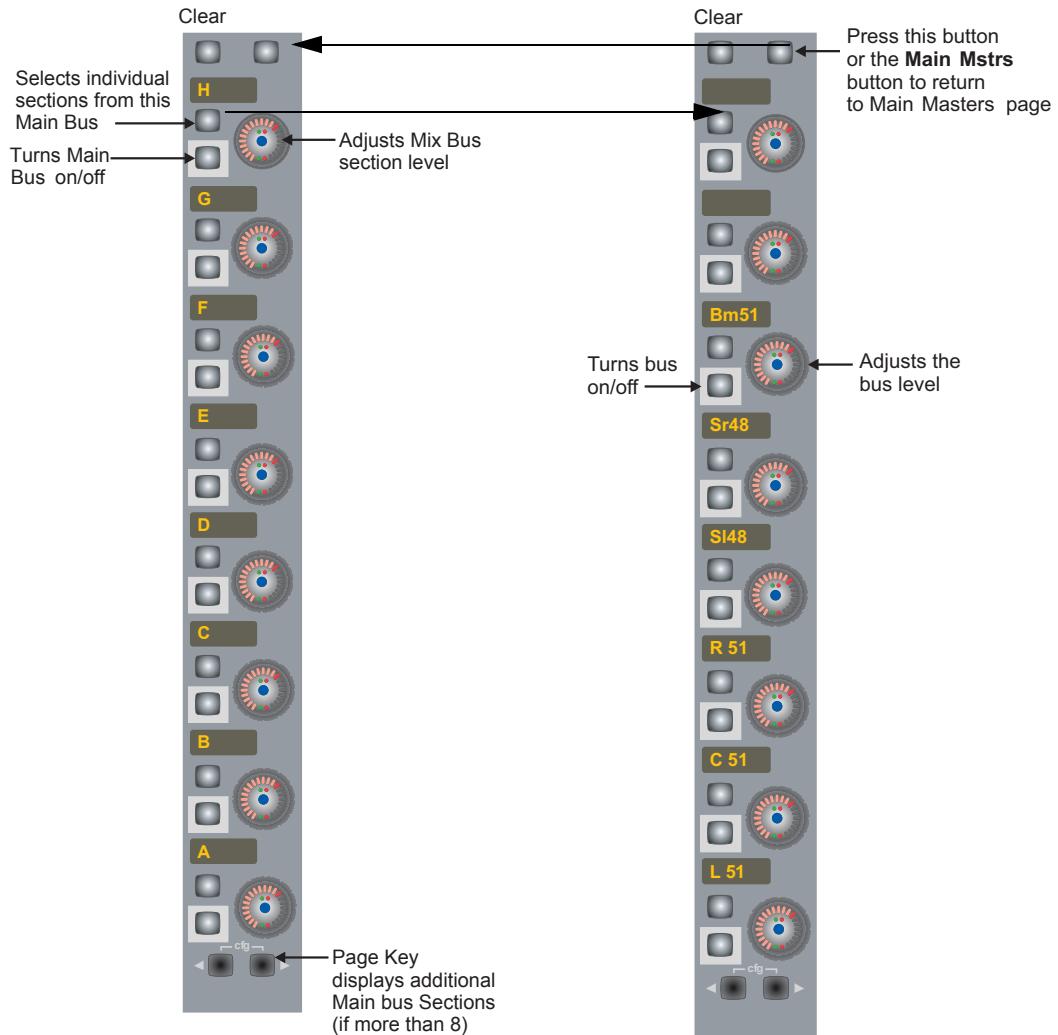


Figure 7-2 Main Bus Master (left) and Individual Bus (right) Displays

The left side of Figure 7-2 shows the Main Bus Master display after pressing the **Main Mstrs** button (or the top-right knobset function key next to **Clear**). The important functions are summarized below:

- Press the upper of the two buttons to the left of each knob to display the individual busses for that Main section.
- Adjust the knob to control the overall level of that Main section.
- Press a knob to display individual section meters on the TFT screen.
- Press the lower of the two buttons to the left of each knob to turn that Main section On/Off. All individual bus parameters are retained if the Bus is turned on after being off.
- Use the **◀** and **▶** buttons to display additional pages if there are more than eight sections.

Individual Main Busses

The right side of Figure 7-2 shows the individual Main Bus display selected by pressing the upper of the two buttons to the left of each knob. The important functionality is summarized below:

- Press the lower of the two buttons to the left of each knob to turn the individual bus On/Off. Its level is retained if that bus is turned on after being off.
- Adjust the knob to set the level for that bus.

7.2.6 Group and Aux Busses

The Group and Aux Bus Masters have the same controls. Press the **Grp Mstrs** or **Aux Mstrs** button to display the first eight Group or Aux Bus Masters. Use the **◀** and **▶** keys to display additional busses. The knobs control the bus levels and the lower button to the left of the knob turns that bus on/off. See *Law Palette* on page 49 to learn how to select the format.

7.2.7 Configuring Aux Busses

With the Aux Busses on the Bus Master knobset, press both **cfg** **◀** and **▶** keys simultaneously (these keys are usually pressed individually to page between groups of eight busses) to display the Aux Bus Settings in the Quick Access Panel. Both **cfg** keys flash to designate the Aux Bus configuration mode.

Each button pertains to an Aux function discussed in the following sections.

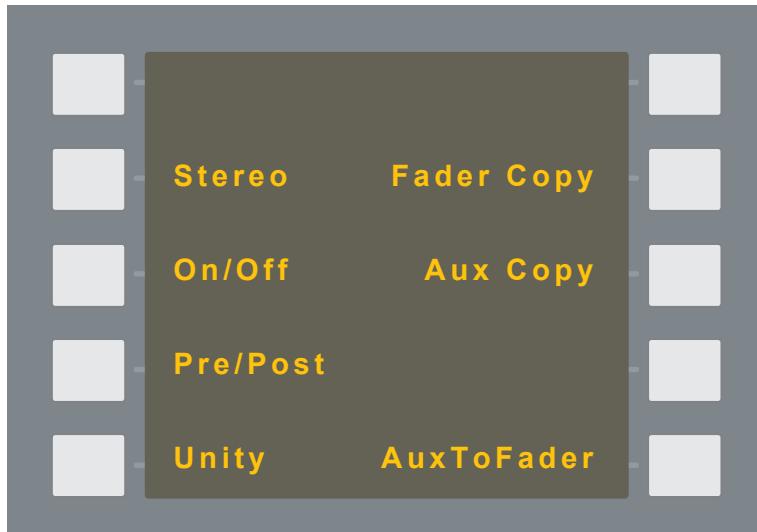


Figure 7-3 Aux Bus Settings

NOTE: The number of aux busses (16 or 24) depends on the Mixer Model.

7.2.8 Toggle Stereo

Pairs of Aux busses can be set to stereo or toggled back to mono from this panel.

1. Press the **Stereo** button.
2. Press an odd numbered Aux bus knob followed by an even numbered Aux bus knob to toggle both between mono and stereo.
3. When finished, toggle additional odd/even numbered pairs or select a different Aux function.

This effects all channels including those not on the surface.

7.2.9 Toggle On/Off

Selected Aux busses can now be toggled on/off from this panel.

1. Press the **On/Off** button.
2. Press the desired Aux bus knob(s).
3. When finished, select a different Aux function.

This effects only those channels on the surface.

7.2.10 Toggle Pre/Post

Selected Aux sends can be toggled pre-/post-fader from this panel.

1. Press the **Pre/Post** button.
2. Press the desired Aux bus knob(s).
3. When finished, select a different Aux function.

This effects only those channels on the surface.

7.2.11 Set Unity

Selected Aux busses can be set to unity from this panel.

1. Press the **Unity** button.
2. Press the Aux bus knob(s) to set to unity.
3. When finished, select a different Aux function.

This effects only those channels on the surface.

7.2.12 Copy Faders to Aux

A useful technique to create a performer's monitor mix is to first create the mix on the faders, which typically feed an output bus, and use those settings as a starting point for the aux mix.

The fader levels (and pan positions for those faders controlling stereo channels) can be copied to a selected Aux bus from this panel.

1. Press the **Fader Copy** button.
2. Press the Aux bus knob that corresponds to the destination the settings are to be copied.
3. When finished, select a different Aux function.

This effects only those channels on the surface.

7.2.13 Copy Aux to Aux

Creating a performer's monitor mix can be faster by starting with an existing aux mix from another performer with similar requirements and copying it to another aux bus.

The settings for one Aux bus can be copied to another from this panel.

1. Press the **Aux Copy** button.
2. Press the Aux bus knob *from* which the settings are to be copied.
3. Press the Aux bus knob *to* which the copied settings are to be pasted.
4. When finished, select other Aux busses to copy or select a different Aux function.

This effects only those channels on the surface.

7.2.14 Aux to Faders

Aux busses are often used to create customized monitor feeds for individual performers. However, creating a mix on the knobs is not as easy as using the faders, which have finer control and better visual indication of relative levels. It is now possible to control a selected Aux bus from the faders. Aux busses now have 12 dB of gain to match the range of the channel fader. After the aux mix is set, the faders are restored to their normal function.

1. Press the **AuxtoFader** button.
2. Press an Aux bus knob to map that Aux bus onto the faders.
3. When finished, select another Aux or select a different Aux function.

This mode stays enabled if you navigate to a different panel so press **Auxto-Fader** again to disable this function when finished.

This effects all channels including those not on the surface.

7.2.15 Bus Master Inserts

Each Group, Main, and Aux Bus has an insert point. See *Main Bus Send/Return* on page 46 to learn about bus insert send and returns specified in PatchNet. Switching the insert in/out works the same for Aux, Main, and Group busses.

1. Press the **Aux Mstrs**, **Grp Mstrs**, or **Main Mstrs** button to display that bus on the Bus Master knobset.
2. Press both **cfg** **◀** and **▶** keys simultaneously.
3. Press the lower button to the left of the knob to activate that bus insert (*In*: button lit). Press the button again to deactivate the bus insert (*Out*: button not lit).

7.3 Main and Group Bus Setup

See *Busses* on page 48 to learn about how to configure the Main and Group Busses.

Chapter 8: Channels and Strips

8.1 Strips

A CM408 module contains eight identical Strips, each with a Main and Swap channel with independent settings. The Strip is the physical control area on the console that contains switches, knobs, displays, and a fader. Figure 8-1 shows a Strip with its meter and status displays that appear on the meter bridge above the channel, and block diagrams for the Swap and Main channels.

System 5-B provides tremendous flexibility in how channels are assigned to Strips and how the Strip controls the channel:

- Any channel can be assigned to any Strip; assignments need not be consecutive.
- Two Strips can control one channel, allowing two users to simultaneously operate that channel.
- Channels with related functions, such as individual drums or drum submixes, can be assigned to neighboring Strips.
- Channel-to-Strip mappings can be named, stored, and recalled as **Layouts** (Section 10.1 - *Layouts*).
- Channel settings can be named, stored, and recalled as **Snapshots** (Section 10.2 - *Snapshots*).

A 96-channel, 48-Strip configuration could map all channels to the control surface: **Main** (channels 1–48 to Strips 1–48); **Swap** (channels 49–96 to Strips 1–48). A 96-channel, 24-Strip System 5 configuration cannot map all channels to the console at once but could use two Layouts to easily interchange all channels.

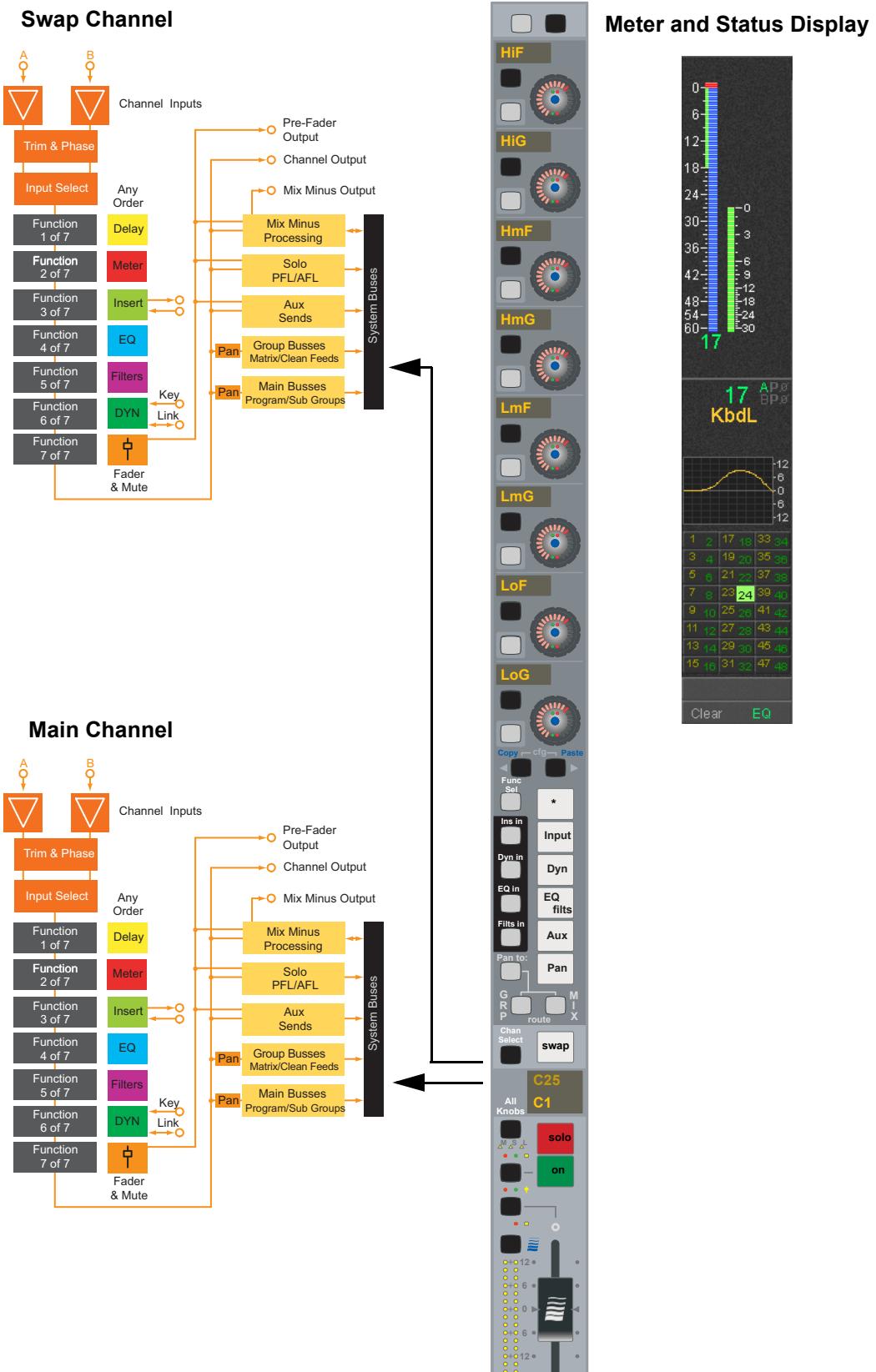


Figure 8-1 The Strip with block diagram for Main/Swap channels and meter/status display

8.1.1 Map Channels and Control Groups to Strips

Each Strip can control a Main and Swap channel. One or both of the channels can be a Control Group instead of a normal channel. Channels can be assigned individually using the Strip controls or to multiple Strips using the **Channel Assign Panel** (page 92).

Individual Assignment: Strip Controls

The **Chan Select** key can be used to assign individual channels to a Strip on the console surface:

1. Access the Main or Swap level to assign the desired channel.
2. Press and hold down the **Wave** key and press the **Chan Select** key.

The channel list appears on the meter bridge screen at the top of the Strip. Control Groups that have been created also appear in the list. The **Accept** and **Abort** keys flash (see Figure 8-2).

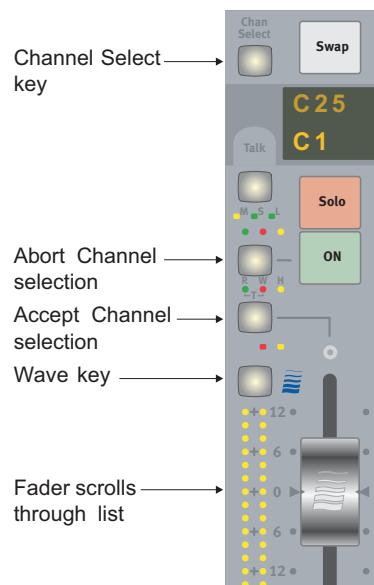


Figure 8-2 Strip controls during channel assignment

3. Use the fader to scroll through the list of channels and Control Groups on the screen; the highlighted entry is selected.
4. Press the **Accept** key to assign the selected channel or the **Abort** key to cancel.

To assign the Swap channel, press the **Swap** key and begin with step 2.

Multiple Assignments: Channel Assign Panel

The **Channel Assign Panel** is most commonly used to assign channels to multiple Strips but can also be used for a single assignment.

1. Press the **Main Panel** key in the center section.
 2. Press the **Channels** key to display the **Channel Assign Panel**.
- Use the **Page** keys to display additional channels.



Figure 8-3 Channel Assign Panel

3. In the **Channel Assign Panel Viewer**, press the key beside the channel you wish to assign.
4. Activate the Main or Swap channel on the Strip you wish to assign the selected channel and press its **Chan Select** key.

Shortcut Assignment for Multiple Channels

Use the following procedure to assign multiple, consecutive channels to the console surface:

1. Press the **Main Panel** key at the bottom of the **Panel Viewer**.
2. Press the **Channels** key in the **Main Panel** to display the **Channel Assign Panel**.
3. In the **Channel Assign Panel**, press the **Auto** key so it illuminates and the key beside the channel to designate as the starting channel.
4. Position your finger over the **Chan Select** key for the first Strip (left-most) you would like to assign on the console.

Because this technique requires a two-key sequence beginning with **Chan Select** and moving to the right to the **Swap** key, the first Strip *must be at the far left of those being assigned*.

5. Begin by pressing the **Chan Select** key on the first Strip, but continue moving your finger to the right across to the **Swap** key of the same Strip.
6. Continue sliding your finger to the right over the **Chan Select** and **Swap** keys of each Strip until you have pressed the **Swap** key on the last Strip you wish to assign.

You have just assigned the Main level on each Strip by pressing its **Chan Select** key. Pressing its **Swap** key enables that Strip to assign its Swap level in step 7.

7. Move your finger back to the first Strip's **Chan Select** key and repeat the same sequence of key presses.

You have mapped the next series of channels to the Swap level on the same Strips on which you set the Main levels.

For example, if the first sequence mapped channels 1–8 to the Main level on eight Strips, the second sequence would map channels 9–16 to the Swap level on the same eight Strips.

8.1.2 Input Names or Channel Number

You can choose whether to display a channel's number or its input names.

1. Press the **Channels** key in the **Main Panel**.
2. Press the **Setup** key in the **Channel Assign Panel**.
3. Use the **Show Input Name** key to toggle between displaying the channel number and the names patched into the channel's A and B inputs.

8.1.3 Strip Utilities

System 5-B provides several useful utilities to operate efficiently with Strips: **Strip Lock**, **Strip Expand**, **Spill Select**, **Fader Unity**, and **Fader Meters** (Figure 8-4).



Figure 8-4 Strip Config panel

Strip Lock

Strip Lock prevents Strip assignments from being changed when a Layout is recalled or when the **All** function is active for another channel.

To activate **Strip Lock**:

1. Press the **Strips** key in the **Main Panel Viewer**.
2. Press the **Strip Lock** key at the top-left of the **Strips Panel Viewer**.

The key flashes when active.

3. Press the **Wave** key on each Strip to lock it.

The red **Strip Lock** LED (above the **Wave** key) illuminates to show the Strip is locked. Press the **Wave** key again to unlock it.

The TFT display shows **Locked** above that Strip.

Strip Expand

Strip Expand expands the display and control of a single Strip over several Strips, permitting easier access to knobset functions (i.e., one Strip has EQ, the next Dynamics, etc.). Changes to the Main or Swap level affects all expanded Strips. **Strip Expand** is also useful for showing multiple Aux send pages when there are more than eight aux sends.

To expand a Strip:

1. Press the **Strips** key in the **Main Panel Viewer**.
2. Press the **Strip Expand** key in the **Strips Panel Viewer**.

The key illuminates when active.

3. Press the **Wave** key on the Strip to expand.

The **Wave** key illuminates.

The yellow **Strip Expand** LEDs (above the **Wave** key) illuminate to designate the expanded Strips.

Spill Select

Spill Select allows Control Groups and Multi Format Masters to *spill* their slaves to a defined area so they can be individually accessed. See *Spill* on page 127 for details.

1. From the **Main Panel**, press the **Strips** key.
2. Press the **Spill Select** key in the **Strips Panel** so it lights.
3. Press the **Wave** key on each Strip to include in the Spill area.

Fader Unity

Fader Unity allows any fader(s) to be automatically set to unity gain (0 dB).

1. From the **Main Panel**, press the **Strips** key.
2. In the **Strip Config Panel Viewer**, press the **Fader Unity** key so it lights.
3. Press the **Chan Select** key for each channel to set unity gain.

The fader moves to 0 dB.

You can also press that channel's **Channel Select** key in the center section Select Panel.



Figure 8-5 Center section Select Panel

4. Deselect the **Fader Unity** key to turn off the Fader Unity function.

Fader Meters

Fader Meters enable the Strip fader LED meters.

On: Displays the channel's input level. This is the PFL input level, not the fader position.

Knob and Fader Text Displays

There are nine options in the Strips Config Panel to choose between values and names on the text displays for knobs and faders:

- Knobs - momentary, show name or show value
- Fader - momentary, show name or show value
- 402 Faders - momentary, show name or show value

8.2 Channel Control Features

8.2.1 Channel Name

The Main and Swap channels are designated by a number (C# by default) or by a four-character name assigned in the **Channel Assign Panel** (see page 92). The Main channel is below the Swap channel; the *active* channel's display is brighter. Press the **Swap** key to switch between the Swap and Main channels. The Strip controls only the active channel.

8.2.2 Function Keys

The **Routing**, **Input**, **Dynamics**, **EQ/Filters**, **Aux Sends**, and **Pan** functions can be assigned to a Strip's eight rotary knobs by the five switches below the knobs. If the function has more than eight parameters, the **◀▶** keys (above * key) page backward and forward to display the additional settings. Four function in/out switches are located to the left of the function selection switches.

8.2.3 Rotary Knobs

Each Strip has eight illuminated, rotary knobs each with a four-character display and two switches. The knob is a continuous controller; as the knob turns, the LEDs on the outer ring light to show the current relative level. The display shows the knob's current function except while adjusting the knob, when it shows the parameter's value.

The lower switch to the left of the knob toggles the knob's function in/out.

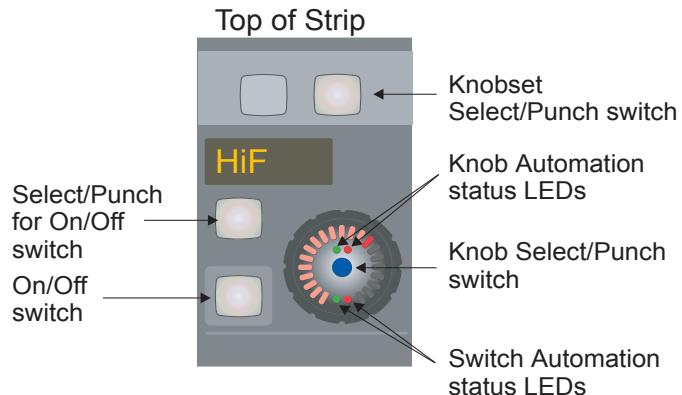


Figure 8-6 Rotary Knob Controls

Select/Punch Keys

There are several **Select** keys on a Strip that operate on different levels:

- At the top of the strip (see Figure 8-6), the **Knobset Select** key selects all knob-set parameters for the currently selected function, including knobs and switches.
- The upper switch to the left of the knob is the **Select** key for the **On/Off** switch below it. This key is used to select the **On/Off** switch for inclusion in a Snapshot and pages to a second knob function, if it exists.
- Each knob has a center switch that selects that knob for inclusion in a Snapshot. Tapping the knob switch shows the value in the display instead of the function name.

8.2.4 Touch-Sensitive Fader and Controls

Each Strip has a touch-sensitive fader. When the fader is touched, the Fader touch-sensor LED lights.

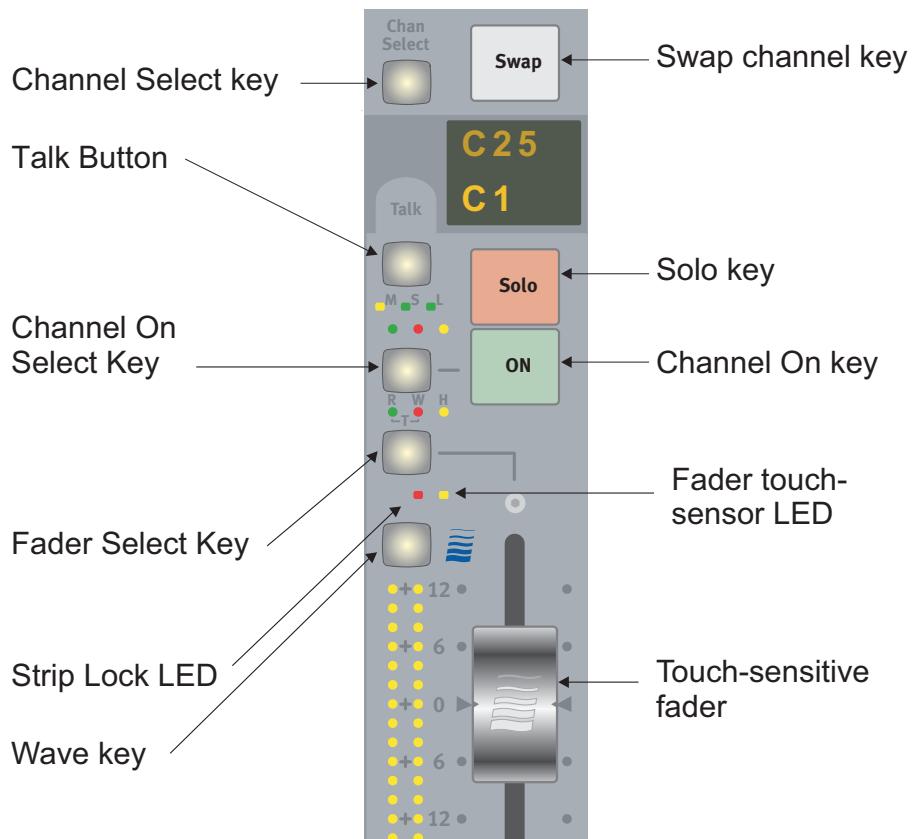


Figure 8-7 Fader Controls

Backstop PFL

The System 5-B faders have a backstop switch past the bottom of their travel. Press **Solo Ctrl** on the Center Section to open the **Solo Control Panel** and select **Backstop PFL** to enable this feature. Then pull and hold a fader into the backstop to route the signal's PFL level to the Solo bus. Release the fader to cancel that fader's routing to the Solo bus. **Backstop PFL** does not affect normal solo operations and can be used on group masters to PFL a Control Group. Deactivating **Backstop PFL** cancels the mode.

8.2.5 Wave Key

The **Wave** key has three functions:

- Press the **Wave** key to bring the Strip (both Swap and Main channels) to the center Strip (see Chapter 6: *CM402 Center Section*).
- Press the **Wave** key when selecting Strips and channels for Layouts, Strip Expand, Strip Lock, or other operations.
- Like a shift key, the **Wave** key modifies other keys.
See 8.2.8 for example.

8.2.6 All Mode

When **All** mode is active on a Strip, that Strip's function and Swap keys operate on *all* Strips currently mapped to the console. This mode is for changing the display only. For example, when setting EQ on a Strip, the other displayed EQ filters on other Strips are not changed.

To activate **All** mode:

1. Hold down the **Wave** key and press the **Clear** key at the top of the Strip (above the top knob's display).
All appears above **Clear**.
2. Press any function key (i.e., EQ, Dyn, etc.) on that Strip and all knobs on the console display that function.
3. Press **Swap** to toggle all Strips between their Main and Swap levels.
4. Hold down the **Wave** key and press the **Clear** key again to disable **All** mode.

The **All** key on the CM401 now sets all strips to All Mode (see page 83).

8.2.7 Talk

Holding down the **Talk** key switches the talkback mic into the channel's **Mix Minus** output (see page 120).

8.2.8 Copy and Paste

Settings from one channel may be copied and pasted to others.

To copy the settings:

1. Press and hold the **Wave** key down and press the **Copy** key.
The Strip dims and the **Copy** key flashes.
2. Press the **Func Select** key (to the left of the * key) to copy the knobset function currently assigned to the knobs to the copy buffer. Other functions can be added to the buffer by pressing their function keys.
3. Press and hold the **Wave** key down and press the **Copy** key to stop it from flashing and exit the mode.

To paste the settings to a new channel:

1. Select the Swap or Main channel within the desired Strip.
2. Press and hold the **Wave** key down and press the **Paste** key on the new channel.
The buffered information is pasted to the channel on the new Strip.

8.3 Channel Processing Functions

System 5-B provides flexible and complete programmable functions for each channel: Input, Dynamics, EQ, Filters, Aux Sends, and Panning.

8.3.1 Inputs

Each channel has an A and B input. See Section 8.4.1 on page 115 to learn about assigning sources for these inputs. The **Inpt** knob (bottom) can feed A, B, or A+B to the channel. These two inputs can be used in many ways but a common application is one Mic and one Line. Another common use is for monitor inputs: Channel 1A is from the Group 1 Bus output while 1B is from the recorder's track 1 output. The A/B source switch then acts as a bus/tape switch.

Press the **Input** function key to display the input controls on the knobset (Figure 8-8). Press the ► key to display the B input page with the same controls as the A input. Press the ► key again to display the Signal Processing In/Out page.

Atrm and **Aphs** have corresponding controls for the B input; **Dly** and **Inp** adjust one parameter that applies to both inputs.

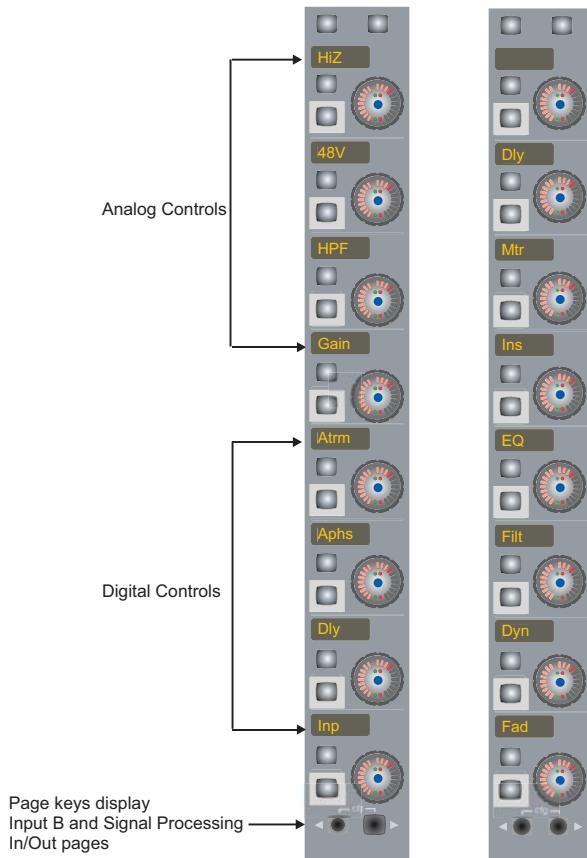


Figure 8-8 Input A (left) and Signal Processing In/Out (right) knobssets

Analog Controls

If an ML530 Mic/Line Interface is patched to the input, the top four knobs show the analog mic/line controls:

- The top knob display shows whether the input is high or low impedance (HiZ = line; LowZ = mic). Press the lower switch to the left of the knob to toggle between values.
- The second knob display shows whether the 48 V phantom power is on/off. Press the lower switch to the left of the knob to toggle phantom power on/off.
- The third knob display shows whether the high-pass filter is on/off. Press the lower switch to the left of the knob to toggle the HPF on/off.
- The fourth knob controls the analog input gain. Spin the knob to adjust the gain between -12 and +72 dB.

NOTE: If an ML530 Mic/Line Interface is not patched to the input, the top four knobs are blank.

Digital Controls

The bottom four knobs control the digital parameters of the A and B inputs:

- The **Atrm** knob adjusts the digital trim ± 15 dB.
- **Aphs** controls the phase of the A input. Press the lower switch to the left of the knob to toggle the phase. The switch lights to indicate phase reversal. Phase reversal is indicated on the TFT screen above the Strip.
- **Dly** controls the delay for both inputs. Press the lower switch to the left of the knob to enable the delay. The switch lights to indicate the delay is active. Then rotate the knob to adjust the delay in the range 0–2160 samples.
- The **Inpt** knob selects between A, B, and A+B. The selection is indicated on the TFT screen above the Strip.

Stereo Controls

There are two additional controls used for stereo channels (see *Multi Format Masters* on page 126).

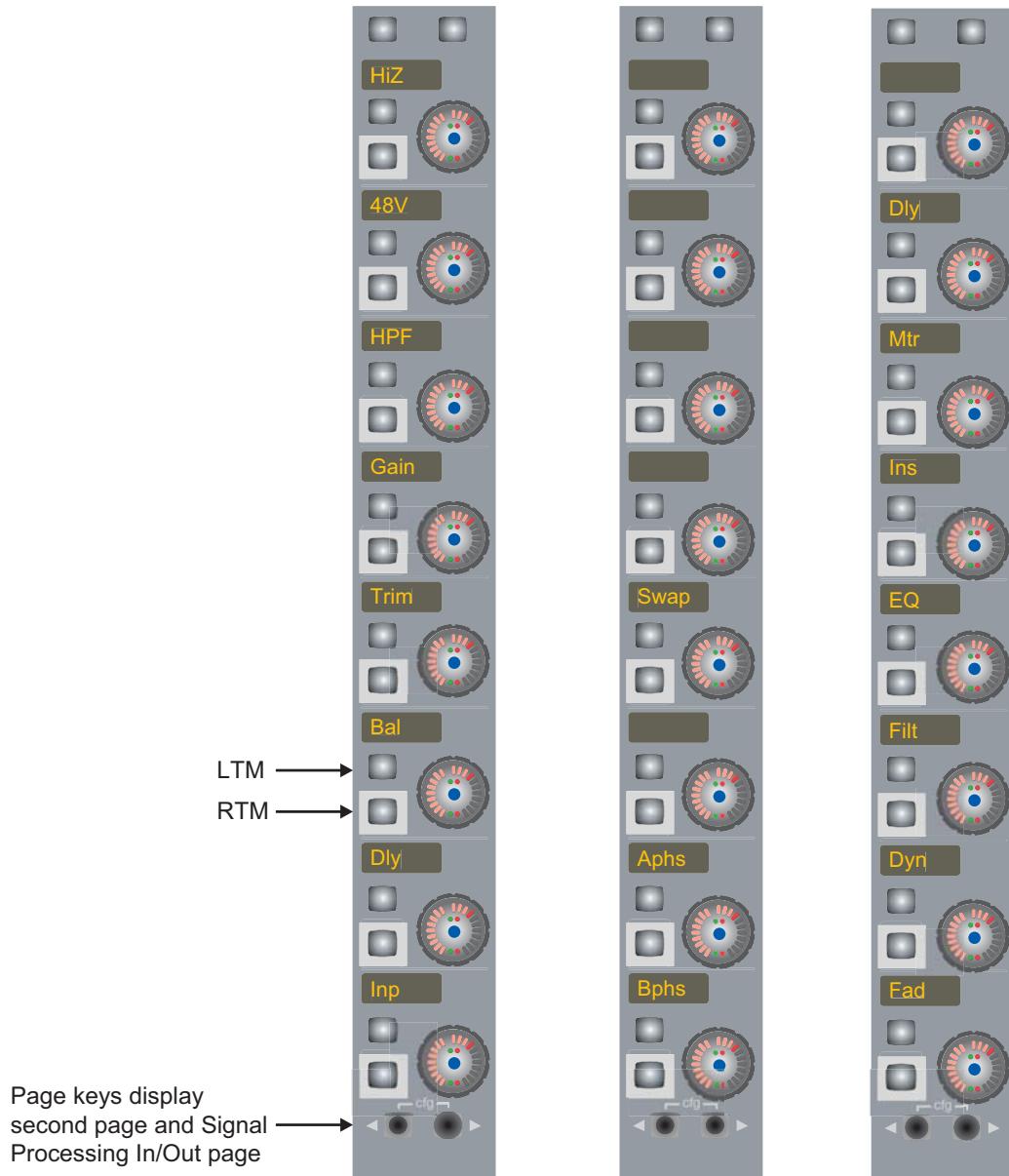


Figure 8-9 Stereo Controls

- **Balance:** Rotate the **Bal** knob left to hear more of the left channel; rotate right to hear more of their right channel. Rotate left or right until the display reads 100L or 100R to hear only the left or right channel.
- **Left-to-mono:** Press the upper key next to the **Bal** knob to send the left channel equally to both the left and right sides of the stereo channel.

Right-to-mono: Press the lower key next to the **Bal** knob to send the right channel equally to both the left and right sides of the stereo channel.

Both-to-mono: Press both keys next to the **Bal** knob to send a mono mix of both channels equally to both sides of the stereo channel. The **Bal** knob then adjusts the mix between left and right channels.

- **Swap:** Press the lower key to reverse the left and right channels.

Signal Processing In/Out

Press the ► key (once from the B Input page, twice from the A Input page) to display the Signal Processing In/Out page. The four lower knobs show the four processors; the signal path is from top to bottom. Press the lower button to the left of the knob to toggle the In/Out status of that processor; the switch lights when the processor is *in*.

NOTE: *The function In/Out switches to the left of the Strip's function switches also toggle the processors In/Out.*

See Section 8.4.2 on page 115 to learn how to change the processor order.

8.3.2 Dynamics

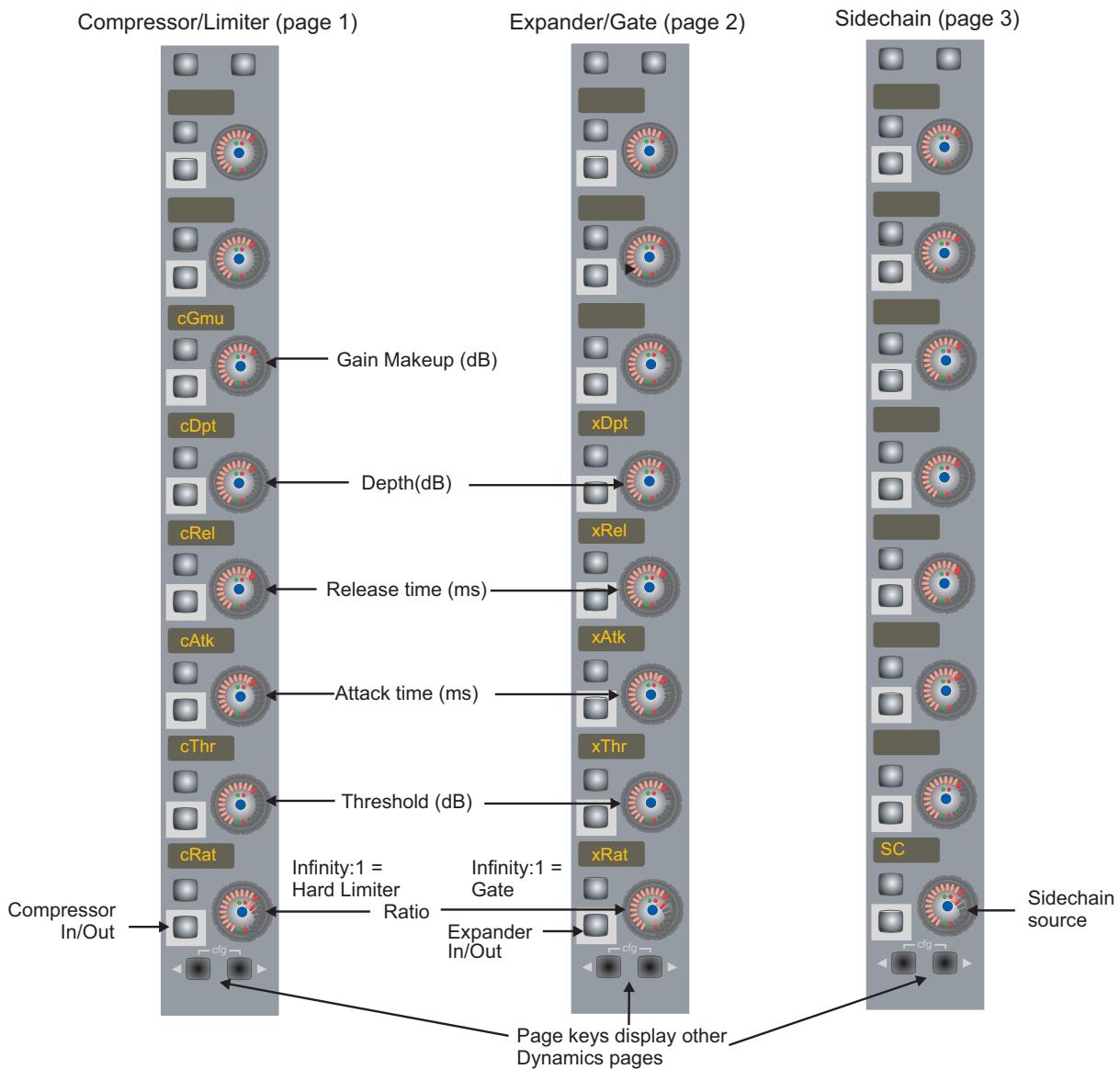
Each channel has a compressor/expander/gate with an external key input. Press the **Dyn** function key to assign Dynamics to the knobset; the TFT display at the top of the Strip shows the dynamics graph (yellow when dynamics are *In*, gray when bypassed). The red dot is a *GainBall* that shows the signal's current gain (y-axis) and the attack and release times as the ball rides up and down the curve.

The Dynamics section may be switched in/out with the **Dyn In** key to the left of the Strip's function keys. The Expander/Gate and Compressor can be switched in/out individually on their respective knobset configuration pages. Use the knob to adjust the parameters. Each section discusses the effect, if any, of the switches.

NOTE: *The Dynamics processor can be set as either Expander/Gate or Compressor but not both simultaneously. Turning on one function while the other is active will switch off the other function.*

The first Dynamics page (Figure 8-10) shows the controls for the compressor. Press the ► key to display pages with the parameters for Expander/Gate and Sidechain.

See Section 8.4.1 - *Channel Patch Points* to see how to patch the sidechain, which can be fed from any source. Patching the sidechain can also be done in PatchNet.

**Figure 8-10** Dynamics knobset pages

The dynamics function consists of the following controls (see Figure 8-10).

Compressor

- cGmu:** gain makeup (dB)
- cDpt:** compressor depth limits the maximum gain reduction in the compressor
- cRel:** Compressor release time
- cAtk:** Compressor attack time
- cThr:** Compressor threshold (dB)
- cRat:** ratio (infinity:1 = hard limiter)

The lower switch next to the **cRat** knob switches the compressor in/out.

Expander/Gate

- xDpt:** expander depth limits the maximum gain reduction in the expander
- xRel:** Expander release time
- xAtk:** Expander attack time
- xThr:** Expander threshold (dB)
- xRat:** ratio (infinity:1 = gate)

The lower switch next to the **xRat** knob switches the expander in/out.

Sidechain

- SC:** sidechain source (channel, key, link)

The lower switch next to the **SC** knob activates sidechain listen mode for that channel.

8.3.3 Equalizers and Filters

Each channel has a four-band, parametric equalizer and two filters. Press the EQ function switch to display the EQ controls on the knobset. Press the ► key to display the Filters page (Figure 8-11).

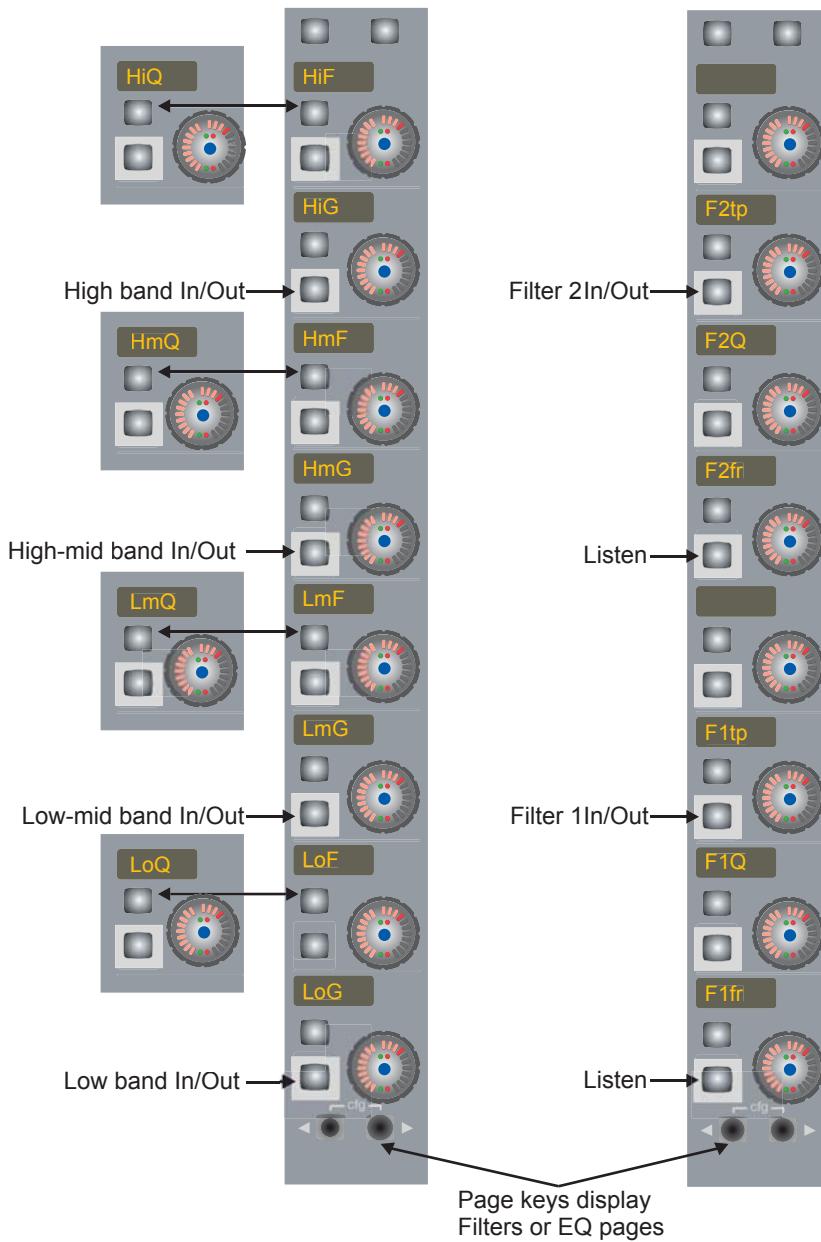


Figure 8-11 EQ and Filters knobsets

Parametric EQ

Each parametric EQ band has two knobs: one shared between frequency and Q and another for gain. Press the upper switch to the left of any of the frequency knobs to toggle between Q and frequency. Use the gain knob to adjust the gain for that band. The lower switch to the left of the gain knob switches that band In/Out.

The four bands are identical (20.5 Hz – 21 kHz) except the HiF and LoF bands can be either peak or shelf filters. Press the lower of the switches to the left of the HiF or LoF knob to toggle between peak (switch lights green) and shelf (no light). Note that this switch indication is present only when displaying frequency on this knob, not Q.

The gain can be adjusted in approximately 1/8 dB increments in the range -24 to +24 dB. As the gain is changed from 0, the LEDs light dimly from the center LED in the direction turned (clockwise = boost); the level is indicated by a bright LED. The LEDs light for every change of 2 dB.

Q can be adjusted in the range 0.2–12 (higher number corresponds to narrower bandwidth). At a given Q setting, changing the gain affects the bandwidth slightly: the bandwidth decreases as gain increases. This creates a wider area of boost/cut at low gain and allows a more natural sound as gain changes without altering the Q. At full boost or cut, the bandwidth is measured 3 dB down from the center frequency.

NOTE: You can use the EQ graph on the TFT display to create a filter in any desired bandwidth.

Since Q and Frequency share the same knob, both parameters are indicated on the knob LEDs: Frequency is indicated by a dim LED at its proportional position from first to last LED. For example, 10 kHz would be approximately in the middle. Q is indicated by bright LEDs extending to either side of the frequency LED.

NOTE: These LED indicators are for fast reference use only; consult the LCD and TFT displays for accurate values.

The TFT screen above the Strip shows the resultant EQ curve (yellow when active, gray when bypassed).

Filters

Two filters are available on each channel. Each filter can be one of four filter types: high-pass filter (HPF), low-pass filter (LPF), band-pass filter (BPF), and notch filter (NTCH). The knobs are used to control the two filters that can be active at one time. The displays are F2tp (filter 2 type), F2Q(filter 2 Q), F2fr (filter 2 frequency), F1tp (filter 1 type), F1Q(filter 1 Q) and F1fr (filter 1 frequency). Select a filter type by rotating the knob. Disable the filter by selecting **OFF**. Rotate the frequency knob to select the filter frequency. Rotate the Q knob to change Q for a notch filter or bandwidth for a band-pass filter. Each filter can be switched In/Out separately. The filters are not attached to the EQ.

See Section 8.4.2 on page 115 to learn how to change the EQ's signal path order.

Filter Q is variable from 0.2 to 12.

To help find problematic frequencies, the Notch filter can be put into a listen mode which temporarily changes the filter to band-pass by pressing the **Listen** key next to the frequency knob. The listen setting is not saved in the Title and is not automated. Listen defaults to Off.

8.3.4 Aux Sends

The CM401 Master module has a Group/Aux Strip used for Aux Master functions. See Section 7.2 - *Bus Master Functions* for general information and Section 7.2.6 - *Group and Aux Busses* to learn how to set up mono and stereo Aux busses.

Aux Sends can be mono or stereo odd/even pairs (i.e., 1/2 not 2/3). Each Aux Send can be configured as pre- or post-fader (Figure 8-12).

Aux Send Knobsets

Figure 8-12 shows the first eight Aux busses with Aux Sends 1/2 and 7/8 set as stereo pairs and others are mono. Press the ► key to display additional busses. Stereo busses use two knobs:

- The Pan knob (top) adjusts the stereo Pan and its lower-left key switches Pan in/out.
- The Gain knob (labeled with the send numbers) adjusts the overall Gain for both sends and its lower-left key switches the pair in/out. The upper-left key switches the send from post- to pre-fader.
- Mono busses use one Gain knob and its lower-left key switches the send in/out. The upper-left key switches the send from post- to pre-fader.

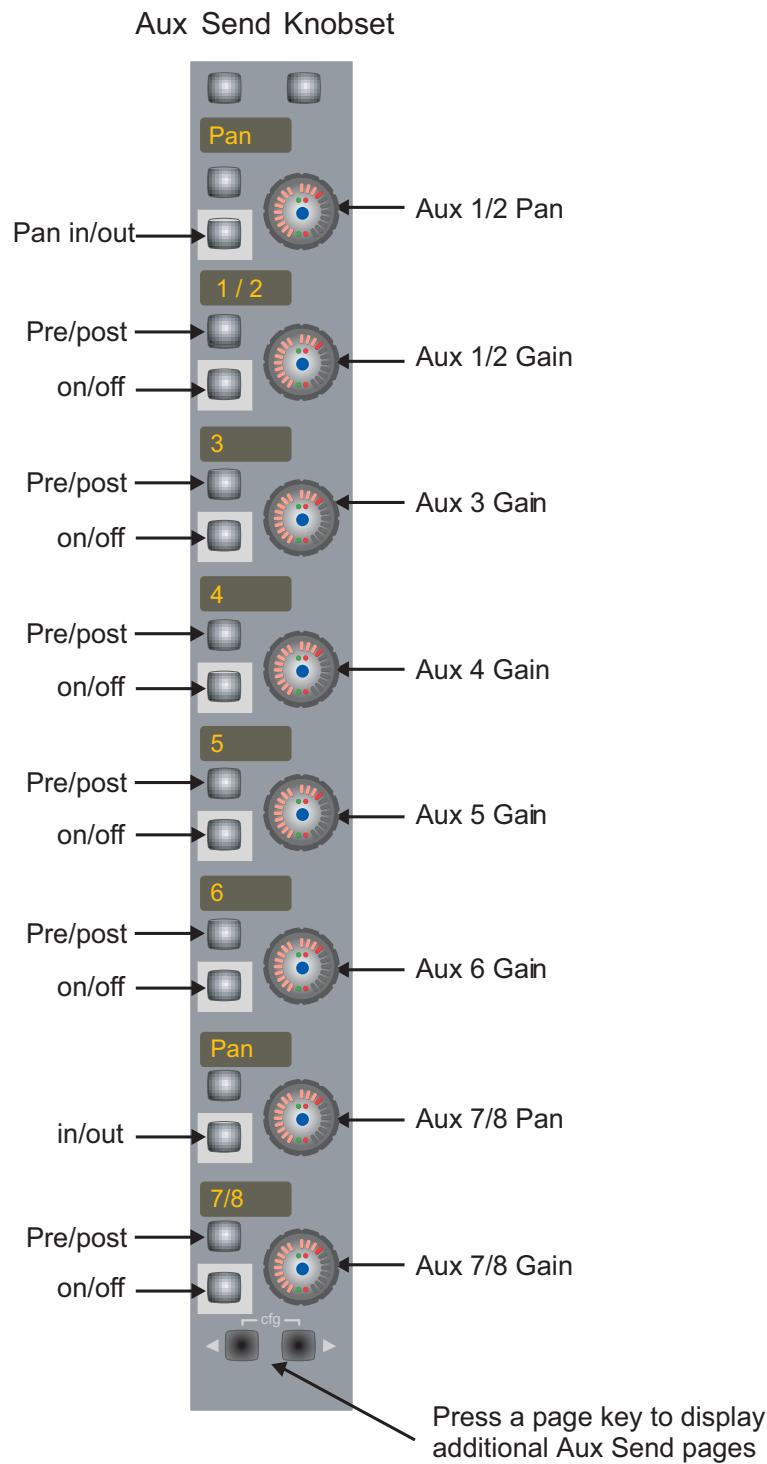


Figure 8-12 Aux Send Knobset and pre/post config pages

8.3.5 Pan

System 5-B is not limited to a single pan format and one pan control per channel imposed by the traditional analog console. System 5-B allows the following pan formats (also called *pan laws*): mono, stereo, LCR, LCRS, 5.1, 6.1, and 7.1.

A single panner can control several different Main or Group busses at once, each with different formats. See Section 7.3 - *Main and Group Bus Setup* to learn how to assign Main and Group Bus formats.

Pan Knobsets

Press the **Pan** function key to assign the Pan parameters to the knobset (Figure 8-13). See Section 8.5.1 - *Group Bus Routing* and/or Section 8.5.2 - *Main Bus Routing* to review how to use the **Pan to:** switch to insert Pan.

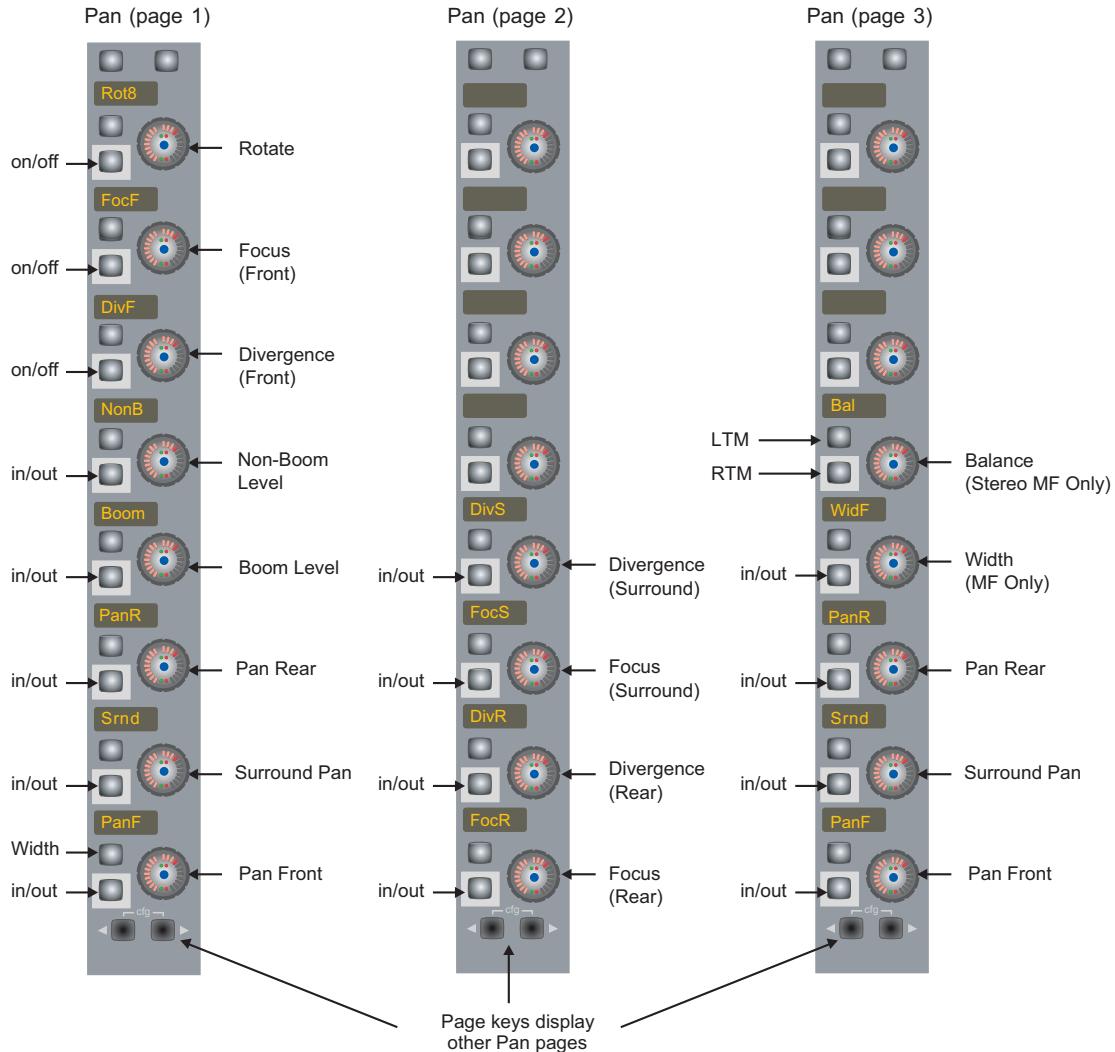


Figure 8-13 Pan Knobsets

Pan Front (PanF): Controls the front channel levels only (i.e., in 5.1-channel format, pan applies to L, C, R).**Rotate (Rot8):** Allows circular panning.

Width (Wdth): Available only on Multi Format Masters (see page 126). Controls the front channel width.

Balance (Bal): Available only on Stereo Multi Format Masters (see page 103). Controls the left/right channel balance, left-to-mono and right-to-mono function.

Surround Pan (Srnd): Controls the front-to-surround levels without changing the individual front or rear pan settings.

Pan Rear (PanR): Same as PanF for rear speakers.

Non-Boom Level (nonB): The level to all channels except the Boom channel. For example, in 5.1-channel format, the Non-Boom level applies to L, C, R, Ls, Rs.

Boom Level (Boom): The level to *only* the Boom channel. For example, in 5.1-channel format, the Boom level applies to only the subwoofer channel.

Focus Front (FocF): This parameter requires at least three speakers to function. Focus ranges from 0–100%. At 100%, the signal has a pinpoint image: as the signal is panned, it crossfades directly from one channel to the next, completely fading from the first *before* entering the third. As Focus decreases, the signal blurs across multiple channels: the signal moves from channel one into two, and then begins crossfading into channel three before channel one has completely faded out. This results in smoother, dynamically panned objects across the sound field.

0% Focus eliminates the center channel from the pan range entirely. The pan control still functions, although the signal crossfades directly from bus one to bus three. One use of 0% Focus is to create phantom-centered images, where the signal is sourced equally from the left and right front speakers instead of directly from the center speaker.

Divergence Front (DivF): This parameter requires at least three speakers to function. Divergence ranges from 0–100%. At 100%, panning works as expected: Panned to maximum left, there is no signal present in the right or center channels; at the center position, no signal is present in the left or right channel, etc. As the Divergence is decreased, the degree of panning is decreased: The signal level increases in channels that previously had no signal and the difference in signal level between channels decreases.

The purpose of Divergence is to allow someone listening on the extreme left or right to hear a sound panned fully to the other side. For example, at 50% Divergence, a sound panned fully left will retain approximately half its signal level in the right channel compared to the left.

Divergence Surround (DivS): Same as Divergence Front.

Focus Surround (FocS): Same as Focus Front.

Divergence Rear (DivR): Same as Divergence Front.

Focus Rear (FocR): Same as Focus Front. Page 2

Pan Graph

When the Pan parameters are on the knobset, a pan graph appears on the TFT screen showing the two-dimensional position (front:surround and left:right) for that channel.

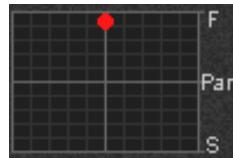


Figure 8-14 Pan graph

SmartPan

The System 5-B panner has an automatic function called *SmartPan* that prevents the disappearance of the audio signal during panning if some of that Main Section's busses are not assigned. For example, if a channel is assigned to a 5.1 Main Section output but does not send anything to the center main bus, SmartPan automatically uses a stereo pan law so the signal is still present when panned to the center. SmartPan is always on and cannot be disabled by the user.

Track Panner Module

The Track Panner Module is a four-Strip wide optional addition to the System 5-B console. It controls the Pan of a channel, Multi Format Master, or Control Group assigned to the Center Strip. Press a Strip's **Wave** key to assign it to the Center Strip; the active channel's Pan is automatically controlled by the Track Panner Module.

The switch to the lower left of the trackball is the **Select/Punch** key for the trackball panner. The switch to the lower right of the trackball provides the same function as the Pan function key on the assigned channel: the Pan parameters are assigned to the knobset and the Pan graph appears in the TFT display.

8.4 Channel Process Order and Patch Points

The seven process functions can be placed in any order to suit different applications. The default order is Delay, Metering, Insert, EQ, Filters, Dynamics, and Fader. The ten patch points are A Input, B Input, Insert Send/Return, Pre-fader Output, Post-fader Channel Output, Dynamics Key Input, Dynamics Side-Chain Link In/Out and Mix Minus Output (see Figure 8-15). All patching can be done from PatchNet (see Chapter 4: *eMix Application*). The A, B, and Key channel inputs can be assigned from the Strip.

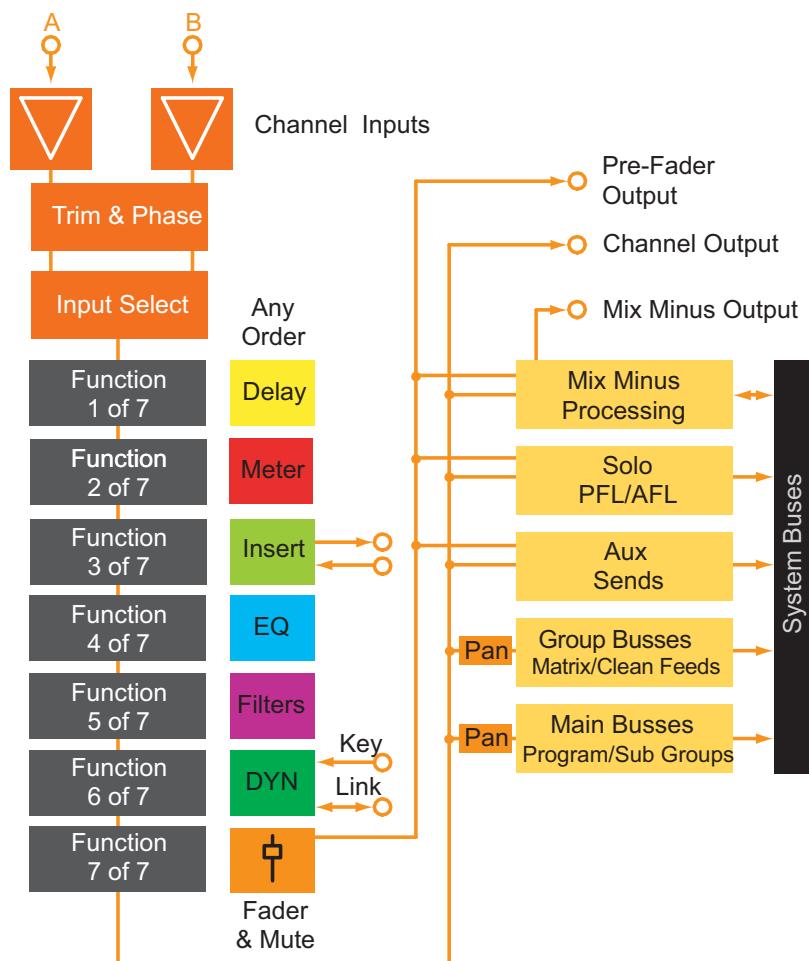


Figure 8-15 Channel processor order and patch points

To display the configuration controls for processor order and patch points:

1. Press the **Input** function key to assign the Input controls to the knobs.
2. Press both **cfg** **◀▶** keys simultaneously to display the configuration pages for patching and processor order on the knobset.
The **cfg** keys flash in configuration mode.
3. Use the **◀▶** keys individually to display the two configuration pages.

8.4.1 Channel Patch Points

The first configuration page allows sources to be assigned to the Key, A, and B inputs. Each input has identical controls.

All patch points can be set in PatchNet (see *Console I/O* on page 40).

To change the source to the A input:

1. Press the **A Input** knob switch.

A scrolling list appears on the TFT display above the Strip.

2. Use the switches to the left of the knob to display other groups of sources. These switches function as page up/down keys in this mode.

Each group is an internal digital or MADI connection that can contain up to 56 audio sources. For example, one group could be mic inputs, another inputs from a digital multitrack machine.

3. When the desired group is located, use the knob to scroll the list to highlight the correct input.
4. Press the knob switch to select that input.
5. Exit configuration mode by pressing both **cfg** **◀▶** keys simultaneously (they stop flashing).

8.4.2 Channel Processor Order

Enter the configuration mode as described in Section 8.4 on page 114. Press the **cfg** **▶** key to display the processor order page. The current order is indicated by the knob display (top = first). To change the order:

1. Press the knob switch for the processor to re-order.

The knob LED flashes and the processor order is displayed on the TFT screen above the Strip. The fader, which becomes the controller to select the order, jumps to a position that reflects the current order.

2. Move the fader up/down to select that processor's new position.

The screen changes to reflect the new order.

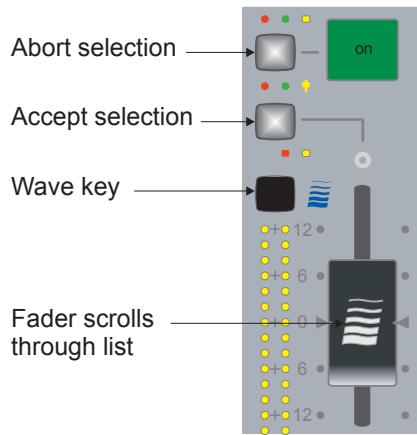


Figure 8-16 Changing processor order

3. When that processor's position is correct, press the fader **Select/Punch** key (above the **Wave** key) to accept the new order.

The knob display changes only after pressing the **Select/Punch** key.

Press the switch next to the **Channel On** key to abort the selection.

8.4.3 Insert Point

Each channel can have an insert point with a send and return that can be patched with PatchNet. The insert point can be anywhere among the six processors (Delay, Metering, EQ, Filters, Dynamics, and Fader) and can be considered as another processor.

The insert point can be switched in/out using the **Ins In** key next to the Strip's function keys or from the third Input knobset page.

8.5 Channel Mixing Functions

8.5.1 Group Bus Routing

System 5-B's group busses can be used for sub-groups, clean feeds and matrix outputs. The center section (CM401) has a Main/Group/Aux Master Strip that controls the master Group functions (see Chapter 7: *Busses and Bus Masters*).

Route a Channel to a Group Bus

To route the post-fader channel signal to a group bus, press the **GRP route** key below the function switches (Figure 8-17). This assigns the Group routing parameters to the knobset (Figure 8-18). Two Group busses are displayed per knob (i.e., 1/2, 3/4, etc.). Since the display shows only four characters, Group 11/12 is displayed as 11/2.

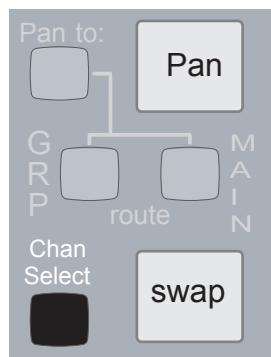


Figure 8-17 GRP and MAIN route switches

The upper switch to the left of each knob assigns the first of the two Groups in the display, the lower switch assigns the second (i.e., for 1/2, upper switch assigns 1, lower assigns 2). Group busses can be assigned in pairs from the switch in the center of the knob. The keys light to indicate this channel is assigned to that Group Bus.

Press the **Pan to:** key to switch Pan in/out for the Group Buss. This key is active only when accessing the Main or Group Bus routing pages. The key lights dimly in other modes to show that Pan is active in Main and/or Group Bus routing. The **GRP route** key also lights dimly in other modes to show that channel is assigned to one or more Group Busses.

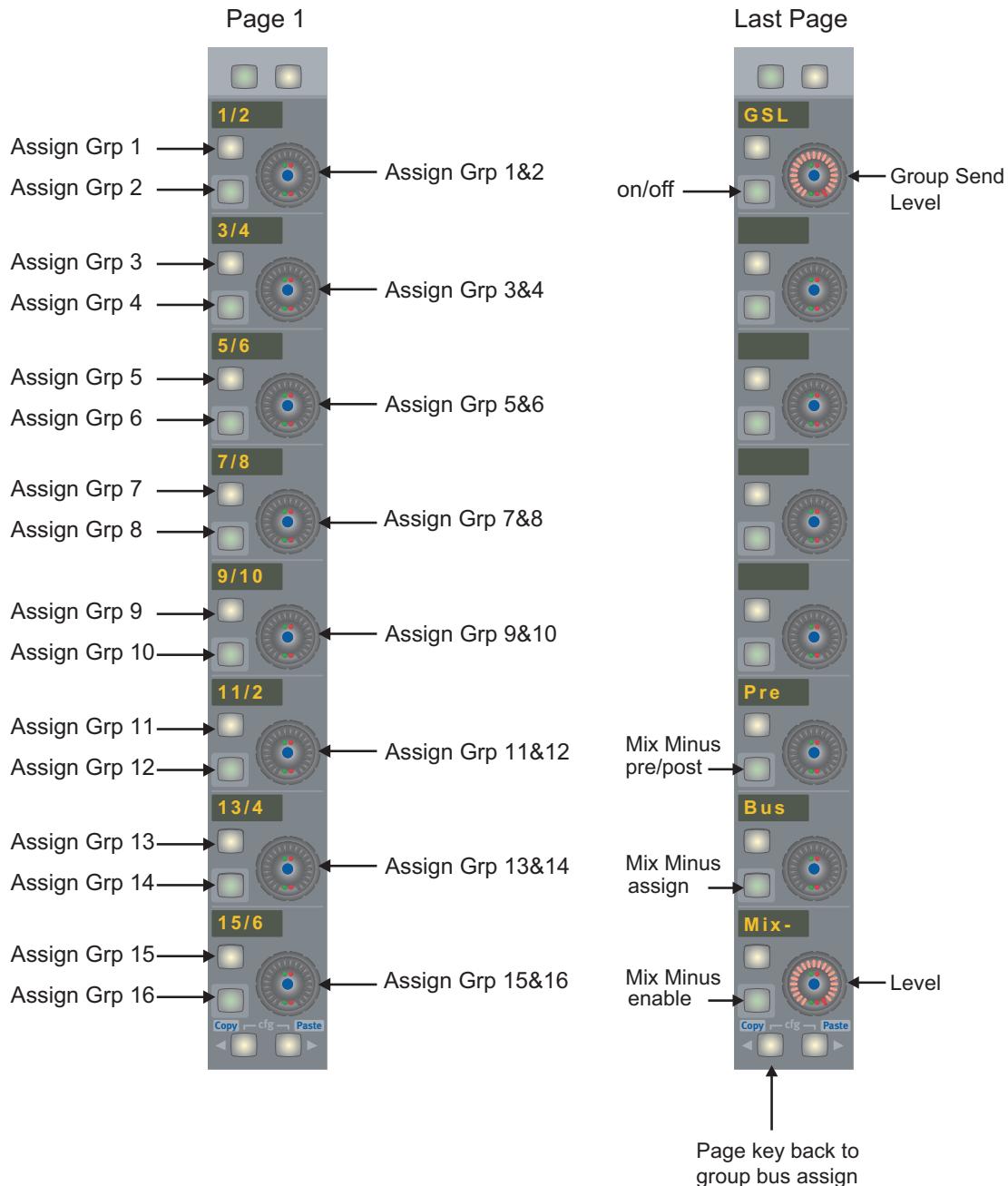


Figure 8-18 Group Bus Routing Knobsets

Press the ► key to display additional Group Routing pages (if there are more than 16 Group busses in this configuration) or the last page, which has the **GSL** (Group Send Level) controls on the bottom knob. The lower switch to the left of the **GSL** knob is the **Group Send** on/off key. The knob adjusts the master level for all Group busses.

8.5.2 Main Bus Routing

There are 16 Main Bus sections comprised of individual busses in a defined pan format. For example, one section with a stereo format uses two busses, another section with a 5.1 format uses six busses. See *Busses* on page 48 for main section setup. The CM401 master section has bus master functions (see Chapter 7: *Busses and Bus Masters*).

Route a Channel to a Main Section

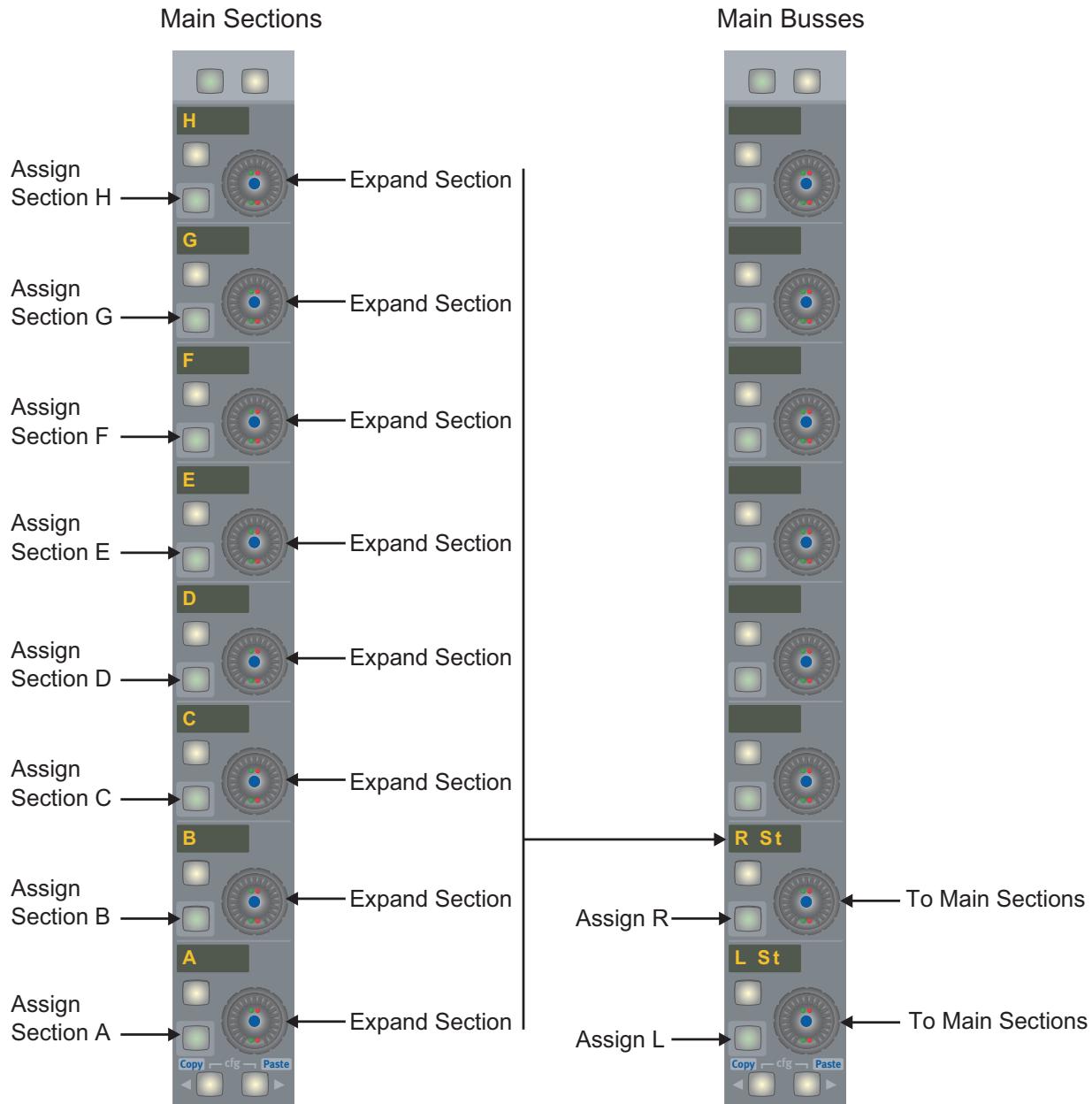


Figure 8-19 Main Section Routing Knobset

To route the post-fader channel signal to a Main bus, press the **MAIN route** key below the function switches (Figure 8-17). This assigns the first eight Main sections that have been defined in eMix to the knobset (Figure 8-19). Press the **►** key to display additional Main Routing pages if there are more than eight.

- The upper switch to the left of each knob allows changing the automation mode. Hold the **Wave** key down and press the switch to cycle through the modes.
- The lower switch to the left of the knob assigns that section.
- The knob center switch brings the individual busses of that main section to the knobset.

Assignments and pan settings are remembered when routing is toggled off and on.

When an individual section is assigned to the knobset, the lower switch to the left of the knob toggles that bus on/off.

Press the **Pan to:** key to switch Pan in/out for the Main sections. This key is active only when accessing the Main or Group Bus routing pages. The key lights dimly in other modes to show that Pan is active in Main and/or Group routing. The **MAIN route** key also lights dimly in other modes to show that channel is assigned to one or more busses.

8.5.3 Mix Minus

Each channel has a mix minus output that can be used to send a unique feed to an announcer. The Mix Minus Reference Bus is a single dedicated mono mix minus bus.

The Mix Minus functions are found on the last page of the **GRP** routing knobset (Figure 8-20). A channel is routed to the mix minus bus by pressing the **Bus** key. Pressing the **Mix-** key creates a feed for an announcer's ear piece on that channel's mix minus output. The channel's signal is subtracted from the mix minus bus, allowing the announcer to hear all voices on the bus except their own.

The signal from the channel to the mix minus system can be set pre or post fader using the **Pre** key.

There is a gain control just before the Mix Minus Output. This is controlled from the **Mix-** knob.

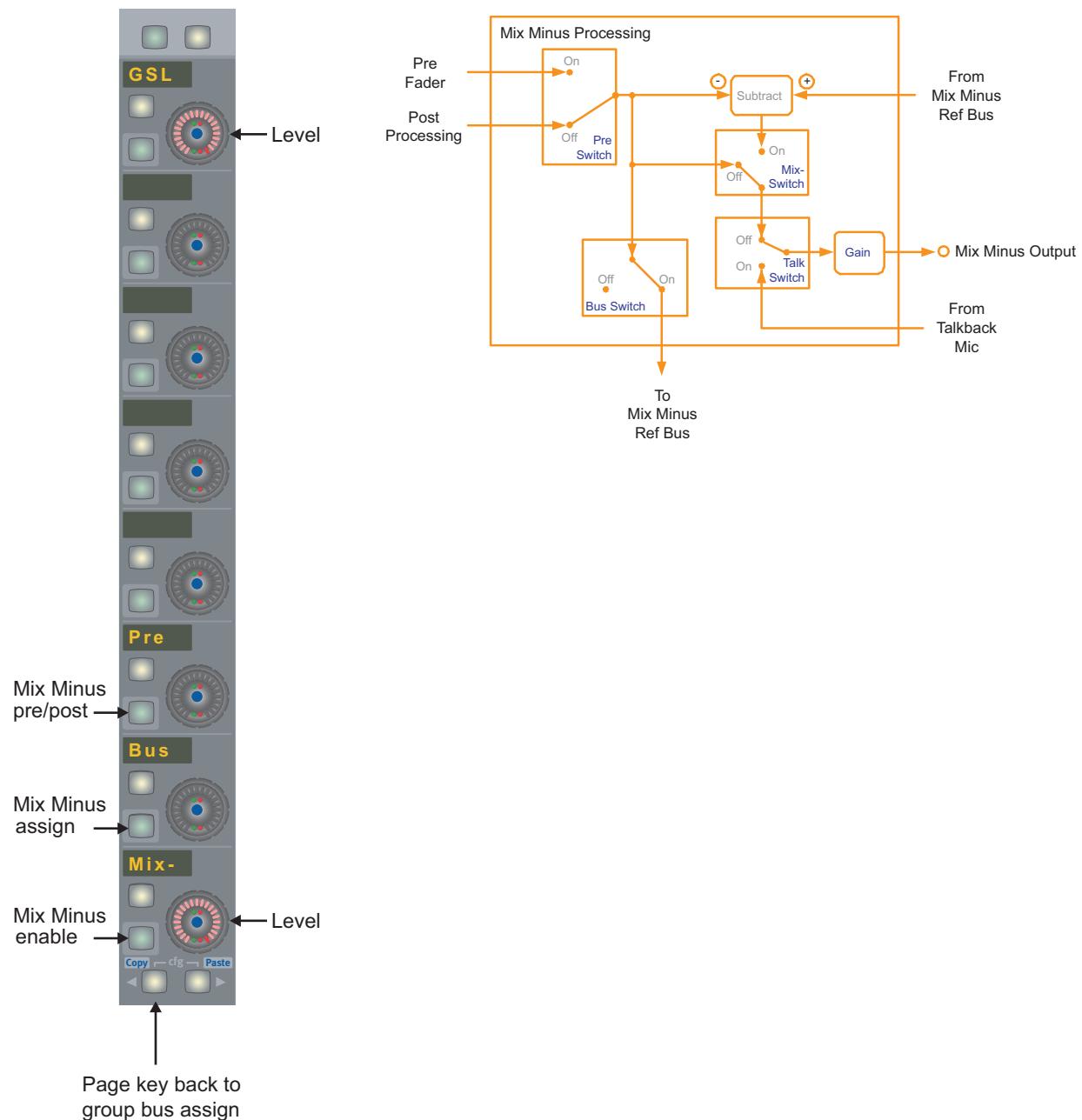


Figure 8-20 Mix Minus Knobset and Signal Flow

Talk

To enable talkback functions:

1. Physically connect the S5's talkback mic to the MC524's **Talkback 1** input.
2. Physically connect the MC524's **Talkback 1** output to a spare A/D input on an AM713.
3. In the Patch view, patch the A/D Source into the **Utility Destinations/Slate-TB_In**.

Holding down the **Talk** key (located to the left of the **Swap** key above the fader) switches the talkback mic into the channel's mix minus output.

Chapter 9: Control Groups and Multi Format Masters

9.1 Control Groups

System 5-B supports **Control Groups** which allow a **Group Master** channel to control multiple *slave channels*. Control Groups are similar to traditional VCA Groups. The Group Master channel can be assigned to a strip just like any other channel. The most common use of a Control Group is to control similar channels from one strip. For example, a single master fader can be used to change the fader level of all announcer mics. System 5-B allows up to 48 Control Groups, each of which can control the following channel settings: Fader, On/Off, Pan, Aux, Filters, EQ, Dynamics and Input.

The relative fader level of each slave channel can be individually set and the master channel preserves these relative fader levels as the master fader is altered. This allows all slave channels to be smoothly faded out by bringing down the master fader. The **Groups Panel** (Figure 9-1) provides the interface to configure the settings. Empty Control Groups are displayed with dim illumination (G5–G24). Press the Page keys to display the two sets of 24 Control Groups.

**Figure 9-1 Groups Panel**

9.1.1 Create Control Group

1. Press the **New** key at the bottom-left of the **Groups Panel** (Figure 9-1).
2. Select the slave channels by pressing their **Chan Select** keys.

The **Chan Select** keys flash to show they are included in the Control Group. Press the **Chan Select** key again to remove it from the Control Group. The Slave LED lights.

3. Press a Control Group key in the **Groups Panel**.

The **Name** key flashes to show the Control Group is ready to be named from the keyboard (four characters maximum).

Other Groups can be included as slaves but a slave from another Control Group cannot be included in the new Control Group.

9.1.2 Assign Control Group to Strip

Assigning a Control Group to a Strip is identical to assigning any other channel; Groups appear in the list when assigning a channel (see Section 8.1.1 - *Map Channels and Control Groups to Strips*). The Master LED lights when a Control Group is assigned to a channel.

9.1.3 Modify Control Group

1. Press the **Mod** key at the bottom-left of the **Groups Panel** (Figure 9-1).
The **Mod** key flashes.
2. Press the Control Group key to be modified.
The Control Group key flashes to show it is ready to be modified. The **Chan Select** keys flash for all channels assigned to that Control Group. The appropriate Swap/Main must be active to see the **Chan Select** key flash.
3. Press the flashing **Chan Select** keys to delete them from the Control Group and non-flashing **Chan Select** keys to add them.
4. Exit this mode by pressing **Mod** again, another Control Group key, or any key that accesses the Panel Viewer.

9.1.4 Name Control Group

1. Press the **Name** key at the bottom of the **Groups Panel**.
The **Name** key begins flashing.
2. Press the key for the Control Group you wish to rename.
3. Name the Control Group from the keyboard (maximum four characters).

9.1.5 Clear Control Group

1. Press the **Clr** key at the bottom of the **Groups Panel**.

The **Clr** key begins flashing.

2. Press the key for the Control Group you wish to clear.

All slaves are deleted from the Control Group, the name reverts to the default (G#), and the display dims to show it is empty.

9.2 Multi Format Masters

A **Multi Format Master** allows stereo, LCRS, 5.1, 6.1, and 7.1 channels to be built from mono channels. The Multi Format Master channel can be assigned to a Strip just like a normal channel. There can be up to 48 Multi Format Master channels.

The most common use of Multi Format Masters is to implement stereo channels. Stereo channels have the following additional controls: **Balance**, **LTM** (Left to Mono), **RTM** (Right to Mono), **Left/Right Swap**. A *both-to-mono* function is available by pressing both the **RTM** and **LTM** keys. For more information, see *Stereo Controls* on page 103.

A Multi Format master channel must be set up first in PatchNet:

1. Click the **Masters** tab at the bottom of the window.

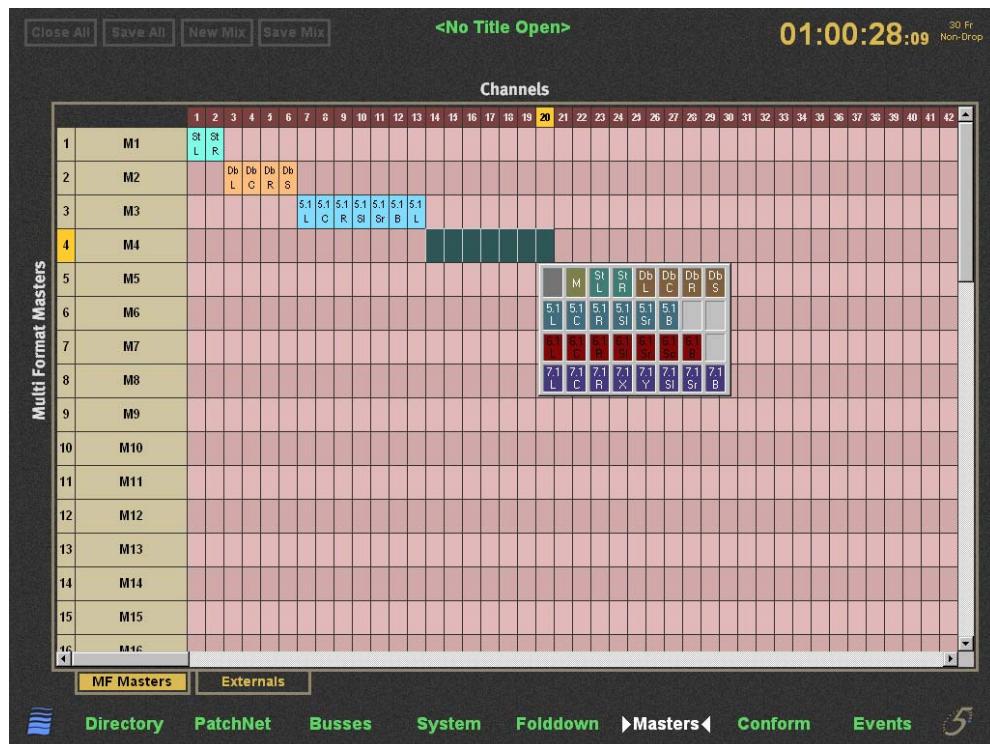


Figure 9-2 Masters Screen

2. Select the channels to include in the master channel by left-clicking and dragging across the desired channels.

The selected channels are now highlighted.

3. Right-click on any highlighted channel to select their channel format.

To group discontinuous channels into a multi-format master, right-click each channel and select the same format.

In PatchNet, the dynamics automatically link stereo, LCRS, 5.1, 6.1, or 7.1 channels.

Place the master on a channel strip like a normal channel:

1. Press the **Masters** key from the **Main Panel**.
2. Select a master channel and assign it to a Strip.

All Multi Format channels have a pan width control activated by the upper switch to the left of the **PanF** knob. Multi Format masters can be automated just like a mono channel.

9.3 Spill

The Spill function temporarily assigns the slaves channels of a Control Group or Multi-Format Master to predefined Strips. See also *Spill Select* on page 96.

1. From the **Main Panel**, press the **Strips** key.
2. Press the **Spill Select** key in the **Strips Panel** so it lights.
3. Press the **Wave** key on each Strip to include in the Spill area.
4. Press the **Chan Select** key on a Group of Multi-Format master to spill its slaves into the selected Spill area.
5. To *unspill* the slave channels from the Spill area and restore the Strip's previous channels, press any master or slave **Chan Select** key.

9.4 Control Groups or Multi Format Masters

This section presents general information to help decide whether to use a Control Group or Multi Format Master for a given task.

If you need to adjust individual parameters on the slave channels, use a Control Group. Multi Format Master channels are set up with all functions on the slave channels switched in. Therefore, adjusting the EQ on the Multi Format Master channel affects all the slave channels. Adjusting parameters on the Control Group Master affects the slave channels only if that function is switched in at the slave when the Control Group was created or subsequently. For example, adjusting EQ on a Control Group master has no effect on the slave channel unless the slave channel's EQ is switched in.

If a VT is playing a stereo format, use a Multi Format Master because they include dedicated stereo functions: LTM, RTM, Balance and Swap (see *Stereo Controls* on page 103).

If the VT is playing dual mono signals (i.e., dialog and music), use a Control Group or just two mono channels because you may want to apply different EQ and compression settings to each signal. Use a Control Group to control multiple mics on a similar source (i.e., crowd or drums).

To summarize:

- True stereo source: Multi Format Master (do not adjust the slave channels)
- Dual mono: Control Group (adjust functions on the slave channels)
- Multiple similar signals: Control Group (adjust functions on the slave channels)

Chapter 10: Layouts and Snapshots

System 5-B performs several mix-management functions significantly faster than any pre-digital mixing system:

- The PatchNet digital signal patching system (see Chapter 4: *eMix Application*) can save a complex patch system for each Title.

Snapshots and **Layouts** further extend this model of flexibility by storing different, but complementary, information that describes the console state at a given time:

- **Layouts** store the channel-to-strip mapping.
For example, channel 8 is mapped to Strip 3 Main level.
- **Snapshots** store the settings of selected channel functions and settings, even if they are not currently assigned to the console surface.
For example, a Snapshot that contains Channel 3's **EQ** and **Dynamics** will restore the values to both functions, regardless of the current knobset function.

Snapshots and Layouts naturally complement each other because their information, while related, does not overlap: Layouts map channels to Strips and Snapshots determine all, or part of, their channel settings.

Naming, storing, modifying, and recalling functions are accomplished through the **Snapshot** and **Layout Panels**, accessed from the **Main Panel**.

10.1 Layouts

A system with 24 Strips and 96 channels cannot map all channels to the console surface at once. Since each Strip can have two channels (Main and Swap), two Layouts are required to map all 96 channels:

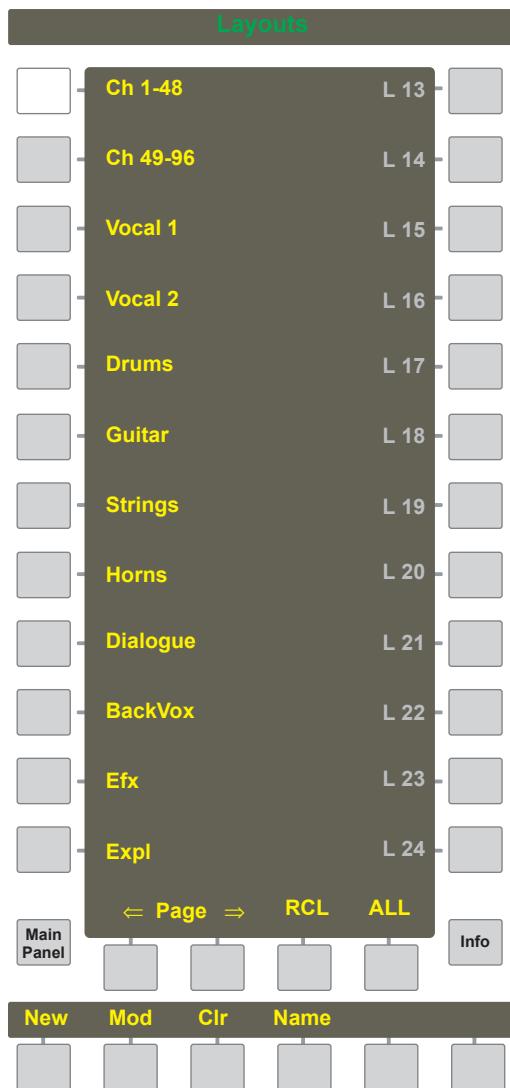
1. Channels 1–24 to Strips 1–24 Main
Channels 25–48 to Strips 1–24 Swap
2. Channels 49–72 to Strips 1–24 Main
Channels 73–96 to Strips 1–24 Swap

A group of channels sharing a common attribute that are normally required on the console at the same time (i.e., drums, vocals, or dialogue) are ideally stored in a Layout.

The **Layouts Panel** provides the interface to name, store, modify, and recall up to 48 channel-to-strip maps.

10.1.1 Create a New Layout

1. From the **Main Panel**, press the **Layout** key to display the **Layout Panel**.
The button beside the last Layout recalled is illuminated.
2. Press the **New** key at the bottom-left of the **Layout Panel**.
The key flashes to signify creation of a new Layout.
3. Select the channels to include in the new Layout:
Press the **ALL** key at the bottom-right of the **Layout Panel** to select all console Strips.
Or
Press the **Wave** key for each Strip to include in the Layout.

**Figure 10-1** Layouts Panel

- To store the new Layout, press the key corresponding to the layout you wish to save in the **Layout Panel**.

Unused locations are darkened and have a default name (L #). In Figure 10-1, the first unused location is **L 13**.

The **New** key darkens and the **Name** key illuminates.

- Use the console keyboard to name the new Layout.

10.1.2 Recall a Layout

To recall a single Layout:

1. If the **RCL** key is not lit, press it once so it flashes.
2. Press the **location** key for the desired Layout.

The Layout reconfigures the console surface and the **RCL** key turns off.

It can be useful to recall several Layouts consecutively to decide which to work with:

1. If the **RCL** key is not lit, press it *twice* so it illuminates but does not flash.
If the **RCL** key is flashing, press it once.
 2. Press the **location** key for the desired Layout.
- The Layout reconfigures the console surface and the **RCL** key remains illuminated for another Recall selection.

10.1.3 Modify a Layout

1. Press the **Mod** key at the bottom of the **Layout Panel** so it flashes.
2. Press the key corresponding to the Layout you wish to modify.
The key begins flashing and the **Wave** keys for Strips in this Layout illuminate.
3. Press an illuminated **Wave** key to exclude a Strip currently in the Layout.
4. Press an unlit **Wave** key to include a new Strip in the Layout.
The **Wave** key begins flashing.
5. Press the Layout's key again to store changes to this Layout.
6. Press the **Mod** key again to exit the modification process.

10.1.4 Rename a Layout

1. Press the **Name** key at the bottom of the **Layout Panel** so it begins flashing.
2. Press the key corresponding to the Layout to rename; that key also flashes.
3. Use the console keyboard to rename the Layout (eight characters maximum) and press **Enter** to exit the process.
You can also press the Layout's key or the **Name** key again to store the new name and exit the renaming process.

10.1.5 Delete a Layout

1. Press the **Clr** key at the bottom of the **Layout Panel** so it begins flashing.
2. Press the key corresponding to the Layout to delete.
That key's display darkens and the name returns to the default (i.e., L #).

10.2 Snapshots

A Snapshot stores selected channel functions, switch states, fader and pan settings, and routings for a selected number of channels. System 5 provides easy methods to store:

- An individual function parameter or switch state;
- The current Knobset function;
- All functions from one or more channels;
- All functions from all channels currently on console surface;
- All functions in all channels in mixer model.

The number of Snapshots that can be stored within System 5-B's pre-defined memory area depends on the content of each Snapshot. There are 240 storage locations but only a fraction of these can be used in the largest console configuration, with all settings stored for all channels.

10.2.1 Create a New Snapshot

1. From the **Main Panel**, press the **Snapshot** key to display the **Snapshot Panel**.
The button beside the last Snapshot recalled is illuminated.
2. Press the **New** key at the bottom-left of the **Snapshot Panel**.
The **New** key flashes to signify creation of a new Snapshot.
3. Select the function(s) to include in the Snapshot using any of the following methods:

Individual Function or Channel Parameter

Press a Strip function's parameter key or switch to select only that parameter (i.e., High EQ, fader on/off, etc.).

Current Knobset Function

Press the **Knobset Select** switch at the top-right of the Strip or the **Func Sel** switch (to the left of the * key) to select all parameters for the current knobset function in the current channel (Main or Swap).

Individual Channels

Press the **Chan Select** key for each channel to include in the Snapshot. All channel settings are included but only for the active layer (Main or Swap).

All Strips on Console Surface

Press the **Strps** key at the bottom of the **Snapshot Panel** to select all Knobset functions and switches for all Strips (both Main and Swap channels) currently on the surface.

Or

All Functions in All Channels in Mixer Model

Press the **ALL** key at the bottom-right of the **Snapshot Panel** to select all Knobset functions in all console channels (Main and Swap for each channel in the Mixer Model). The ALL keys in the automation area perform the same function.

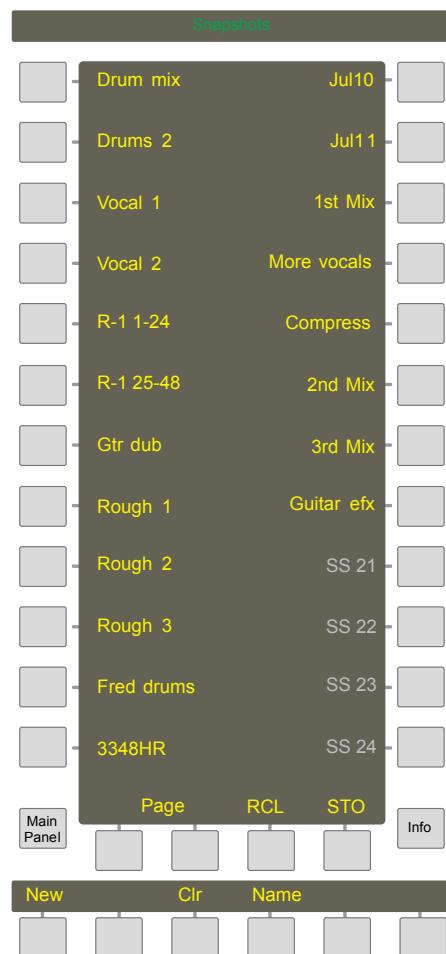


Figure 10-2 Snapshots Panel

4. Press an unused key in the **Snapshot Panel** to store the new Snapshot.

Unused locations are darkened and have a default name SS #. In Figure 10-2, the first unused location is **SS 20**. *It is not possible to overwrite an existing Snapshot. To reuse an existing location, delete the Snapshot first (page 136).*

The **New** key darkens and the **Name** key illuminates.

5. Use the console keyboard to name the new Snapshot and press **Enter**.

It is worth mentioning that after a Snapshot is created, there is no method to determine its exact contents. For this reason, we recommend storing complete channels and using a descriptive name. See *Update Snapshot* for information about modifying a Snapshot.

10.2.2 Recall a Snapshot

To recall a single Snapshot:

1. If the **RCL** key is not lit, press it once so it begins flashing.
2. Press the key corresponding to the Snapshot you wish to recall.

The Snapshot restores the selected settings and the **RCL** key turns off.

It is sometimes useful to recall several Snapshots consecutively to decide which one to work with:

1. If the **RCL** key is not lit, press it *twice* so it illuminates. If the **RCL key** is flashing, press it once.
2. Press the key corresponding to the Snapshot to recall.

The Snapshot reconfigures the console surface and the **RCL** key remains illuminated for another selection.

10.2.3 Update Snapshot

If function or switch values in a Snapshot change, they can be updated easily.

1. Press the **STO** key at bottom-right of the **Snapshot Panel**.

The **STO** key begins flashing.

2. Press the key for the Snapshot to update.

Only the items from the Snapshot are updated to the current settings.

10.2.4 Rename a Snapshot

1. Press the **Name** key at the bottom of the **Snapshot Panel** so it begins flashing.
2. Press the key corresponding to the Snapshot to rename.
That key flashes.
3. Use the console keyboard to rename the Snapshot (eight characters maximum).
4. Press the **Enter** key on the keyboard, the Snapshot's key, or **Name** key again to store the new name and exit the process.

10.2.5 Delete a Snapshot

1. Press the **Clr** key at the bottom of the **Snapshot Panel** so it begins flashing.
2. Press the key corresponding to the Snapshot to delete.
That key's display darkens and the name returns to the default (i.e., SS #).

***NOTE:** A Snapshot must be deleted before its location can be used again.*

Chapter 11: GPI/O Event System

The event system can program many System 5-B features. The following features are very useful:

- use a fader to start a cart machine or turn speakers on/off;
- turn a channel on/off in response to a camera turning on/off.

An event consists of a set of input conditions governed by a logical operator that determines the output condition. Inputs can be surface parameters (i.e., channel on, fader, etc.) or external inputs via the GP132. Outputs can be System 5-B parameters or external outputs via the GP132.

GP132

The GP132 (General Purpose Input/Output Relay System) is used to communicate to devices that use tallies and relays. Although the GP132 is shipped with all systems, many events do not require it.

The following special considerations should be noted when using the GP132:

- MIDI cables are used to connect GP132 to System 5. The MIDI specification for maximum cable length is 10 m. Cables over this length may cause data loss.
- If power fails on the GP132, none of the relays will function. After restoring power, the GP132 resets ALL relays.

11.1 Input Types

Table 11-1 GP Input Types, Settings, and Activation Values

Input Type	Settings	Activation Values
Control Room	Monitor A Monitor B Monitor C Monitor D Control Room Cut Control Room Dim	On Off
Fader	Channel #	Activation Level (dB) Activation Type (Above/Below)
GP Input	Relay Input #: (1-32) Machine: GP132 One GP132 Two GP132 Three GP132 Four GP132 Five	On Off
Switch Input	Channel # Channel EQ Filters Dynamics	On Off

11.2 Output Types

Table 11-2 GP Output Types, Settings, and Activation Values

Output Type	Settings	Activation Values
Control Room	Monitor A Monitor B Monitor C Monitor D Control Room Cut Control Room Dim	On Off
GP Output	Relay Output #: (1-32) Pulse length ms (0 to latch): 0 to -1000 ms Machine: GP132 One GP132 Two GP132 Three GP132 Four GP132 Five	Open Closed
Switch Output	Channel # Channel EQ Filters Dynamics	On Off
Layout Recall	1-48	
Snapshot Recall	1-240	
TalkBack Control	Mon A-D All Mons Aux Bus	On Off

11.3 Logical Operators

The logical operators process input event conditions to determine if the output event is executed.

Table 11-3 Logical Operators Used for GPIO Event Processing

Logical Operator	Required Input Conditions for Output Event Execution	Truth Tables
AND	All input events must be true	$1 \text{ AND } 1 = 1$ $1 \text{ AND } 0 = 0$ $0 \text{ AND } 0 = 0$
OR	Any input event true	$1 \text{ OR } 1 = 1$ $1 \text{ OR } 0 = 1$ $0 \text{ OR } 0 = 0$
XOR	Any input event true, but <i>not all</i> true	$1 \text{ XOR } 1 = 0$ $1 \text{ XOR } 0 = 1$ $0 \text{ XOR } 0 = 0$

NOTE: All logical operators are transitive: $1 \text{ AND } 0 = 0 \text{ AND } 1$

11.4 Event Configuration Display

Access the **Events** configuration screen by clicking the **Events** tab at the bottom of the eMix screen. The **Events** screen has three sections: **Inputs**, **Event List**, and **Outputs**.

Several useful examples are included in Section 11.9 on page 143.

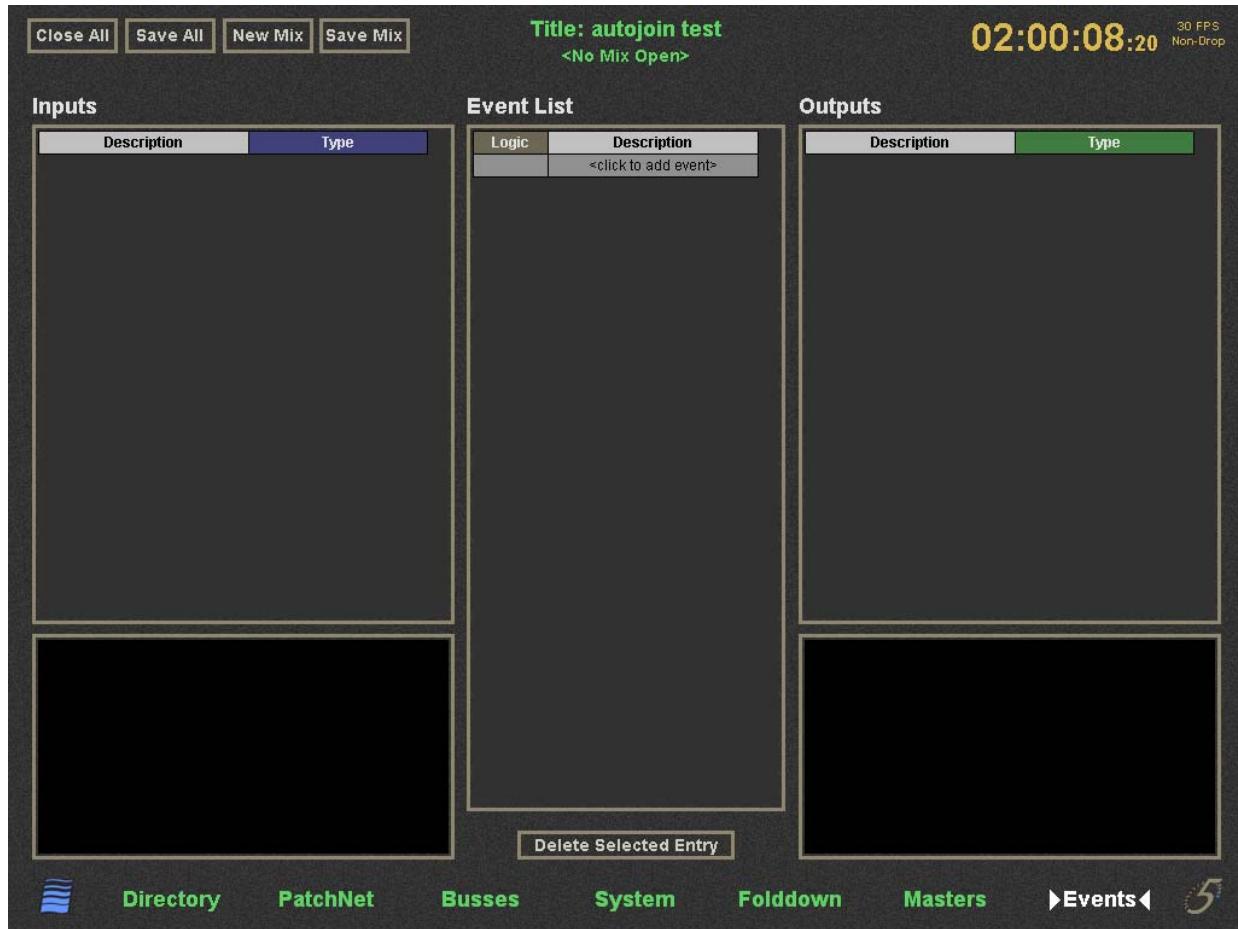


Figure 11-1 Event Configuration Window

11.5 Event List

An *event* is composed of an input description and type, a logical operator, and an output description and type. Add an event to the list by clicking the **<click to add event>** field at the bottom of the **Description** column. Click in the **Description** field to type a description. Select the logical operator from the **Logic** dropdown menu.

11.6 Input

The input area has two sections: the top contains a list of inputs for all events in the **Event List**, the lower shows the properties of the selected input.

Create a new input by clicking the **<click to add input>** field at the bottom of the list. The **Add Input Event** dialog opens to select the input type:



Figure 11-2 Add Input Event Dialog

Select the **Input Type** from the dropdown menu and click **OK**. Enter a text description by typing in the **Description** field; be sure to identify the event it pertains to.

The properties area displays the settings for the selected input type (see Table 11-1 and Table 11-2 for settings for each input/output type). Modify the settings by clicking on the dropdown menu and/or edit display.

11.7 Output

The output area has two sections. The top contains a list of output actions for all events in the **Event List**. These actions occur only if the input conditions for the selected event combined with their logical operator yield *True*. The lower area shows the properties of the selected output. Set the outputs using the same methods as the inputs.

11.8 Deleting Events

Delete an event by selecting the event, input, or output and pressing the **Delete Selected Entry** button at the bottom-left of the **Events** screen.

11.9 GPI Examples

Refer to Figure 11-1 and Figure 11-2 for these examples. The options available in the Input and Output Properties areas are summarized in Table 11-1 and Table 11-2.

If an event consists of just one input, AND and OR deliver the same result and may be used interchangeably.

11.9.1 Move a Fader to Turn Off the Floor Monitors

This example demonstrates how to turn off the floor monitors by moving any one of several faders above a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the <click to add event> field.

The **Add Event** dialog appears.

2. Select **Or** as the logical operator from the dropdown menu.
3. Under **Input**, click on the <click to add input> field.

The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.
5. Configure the Input Properties to the following settings:

Channel # 1

Activation level (dB) -50

Activation Type Above

6. Repeat steps 3–5 for any additional channel faders and set the **Channel #** in step 5 to the new channel number.
7. Under **Output**, click on the <click to add output> field.

The **Add Output Event** dialog appears.

8. Select **Control Room** from the dropdown menu and click **OK**.
9. Configure the Output Properties to the following settings:

Action Monitor A

Active State Off

11.9.2 Move a Fader to Turn On the Floor Monitors

This example demonstrates how to turn on the floor monitors by moving any one of several faders below a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the <click to add event> field.

The **Add Event** dialog appears.

2. Select **OR** as the logical operator from the dropdown menu.
3. Under **Input**, click on the <click to add input> field.

The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.
5. Configure the Input Properties to the following settings:

Channel # 1

Activation level (dB) -50

Activation Type Below

6. Repeat steps 3–5 for any additional channel faders and set the **Channel #** in step 5 to the new channel number.
7. Under **Output**, click on the <click to add output> field.

The **Add Output Event** dialog appears.

8. Select **Control Room** from the dropdown menu and click **OK**.
9. Configure the Output Properties to the following settings:

Action Monitor A

Active State On

11.9.3 Move a Fader to Start a Cart Machine

This example demonstrates how to start a Cart machine by moving a fader above a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the <click to add event> field.

The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.
3. Under **Input**, click on the <click to add input> field.

The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.
5. Configure the Input Properties to the following settings:

Channel # 2

Activation level (dB) -50

Activation Type Above

6. Under **Output**, click on the <click to add output> field.

The **Add Output Event** dialog appears.

7. Select **GPO** from the dropdown menu and click **OK**.
8. Configure the Output Properties to the following settings:

Output Number 1

Active State Closed

Pulse Length 10

Machine GP132 One

11.9.4 Move a Fader to Stop a Cart Machine

This example demonstrates how to stop a Cart machine by moving a fader below a selected level.

1. In the **Event Configuration** window, under **Event List**, click on the <click to add event> field.

The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.
3. Under **Input**, click on the <click to add input> field.

The **Add Input Event** dialog appears.

4. Select **Fader** from the dropdown menu and click **OK**.
5. Configure the Input Properties to the following settings:

Channel # 2

Activation level (dB) -55

Activation Type Below

6. Under **Output**, click on the <click to add output> field.

The **Add Output Event** dialog appears.

7. Select **GPO** from the dropdown menu and click **OK**.
8. Configure the Output Properties to the following settings:

Output Number 2

Active State Closed

Pulse Length 10

Machine GP132 One

11.9.5 Video Switcher Turns a Specific Camera and Channel On

1. In the **Event Configuration** window, under **Event List**, click on the <click to add event> field.

The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.
3. Under **Input**, click on the <click to add input> field.

The **Add Input Event** dialog appears.

4. Select **GPI** from the dropdown menu and click **OK**.
5. Configure the Input Properties to the following settings:

Input # 1

Active State On

Machine GP132 One

6. Under **Output**, click on the <click to add output> field.

The **Add Output Event** dialog appears.

7. Select **Switch Output** from the dropdown menu and click **OK**.
8. Configure the Output Properties to the following settings:

Channel # 3

Switch Function Channel

Activation Value On

11.9.6 Video Switcher Turns a Specific Camera and Channel Off

1. In the **Event Configuration** window, under **Event List**, click on the <click to add event> field.

The **Add Event** dialog appears.

2. Select **AND** as the logical operator from the dropdown menu.
3. Under **Input**, click on the <click to add input> field.

The **Add Input Event** dialog appears.

4. Select **GPI** from the dropdown menu and click **OK**.
5. Configure the Input Properties to the following settings:

Input # 1

Active State Off

Machine GP132 One

6. Under **Output**, click on the <click to add output> field.

The **Add Output Event** dialog appears.

7. Select **Switch Output** from the dropdown menu and click **OK**.
8. Configure the Output Properties area to the following settings:

Channel 3

Switch Function Channel

Activation Value Off

11.9.7 Audio Follow Video

In this example, there are four cameras each with a microphone configured with a video switcher, GP 132, and System 5-B console (Figure 11-3).

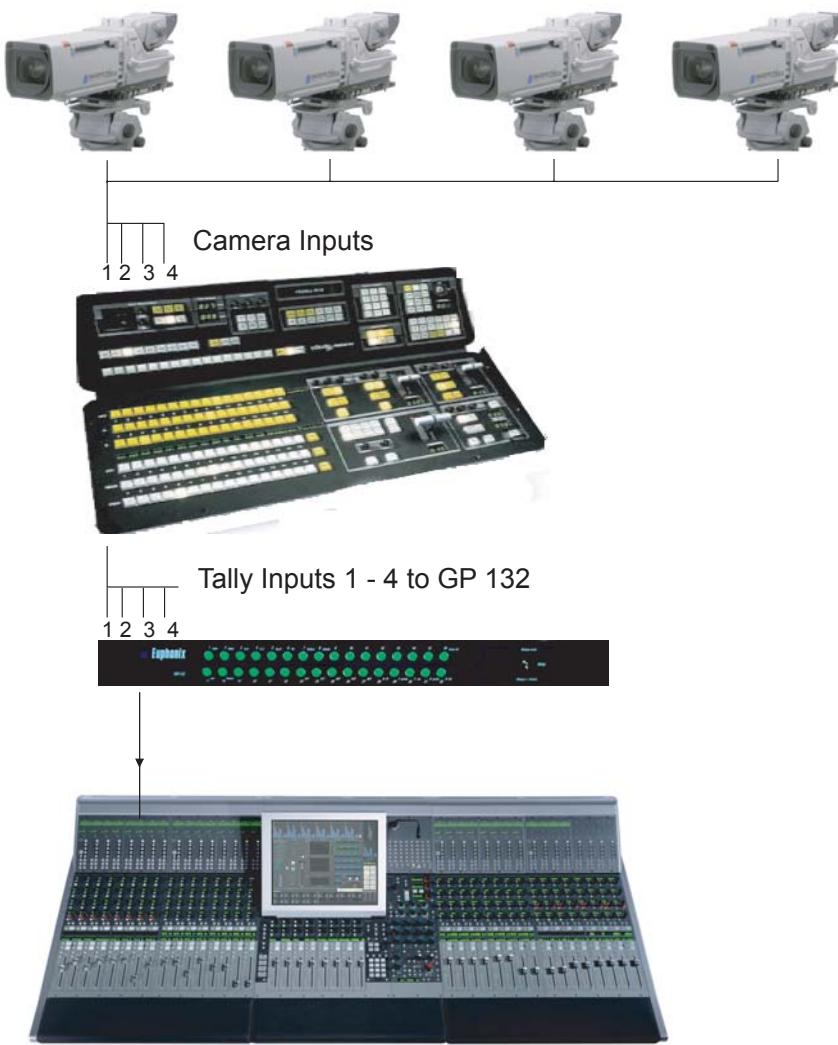


Figure 11-3 Audio Follow video configuration

The goal is to enable the following functionality:

- When the video switcher takes camera 1, channel 1's audio is on while channels 2–4 are muted.
- When the video switcher takes camera 2, channel 2's audio is on while channels 1, 3, and 4 are muted.
- When the video switcher takes camera 3, channel 3's audio is on while channels 1, 2, and 4 are muted.
- When the video switcher takes camera 4, channel 4's audio is on while channels 1–3 are muted.

The following steps explain how to turn channel 1 on and mute the other channels when the video switcher takes camera 1.

1. Choose a tally input to use on the GP 132.
For example, tally input 1 uses pins 1 and 14 on connector RT1 of the GP 132.
2. In **Events** page of eMix, click **<click to add event>** in the Events List section, and select *OR* as the logic operator.
3. From the **Inputs** section, click **<click to add input>**.

The Add Input Event dialog opens.



Figure 11-4 Add Input Event Dialog

4. Select **GPI** from the **Input Types** dropdown menu.
5. Configure the lower area of the **Input** section to the following settings:



Figure 11-5 Input Event Properties

6. From the **Output** section, click <click to add output event>.

The Add Output Event dialog opens.



Figure 11-6 Add Output Event dialog

7. Select **Switch Output** from the **Output Type** dropdown menu.
8. Configure the lower area of the **Output** section to the following settings:



Figure 11-7 Output Event Properties

This turns channel 1 on when camera 1 is selected by the video switcher.

9. Repeat Steps 6–7 to create additional output events to mute channels 2–4 but use the following settings instead of those depicted in Step 8:

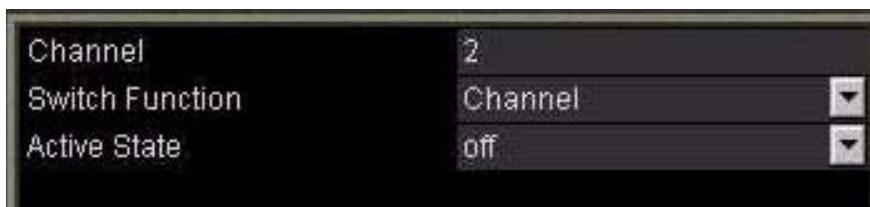


Figure 11-8 Output Event Properties

Figure 11-8 shows Channel 2's settings; each channel uses its own number but **Switch Function = Channel** and **Active State = off** for each.

So far, you have achieved the following functionality: when the video switcher selects camera 1, System 5-B's channel 1 turns on and channels 2–4 mute. Repeat the steps above to program channel 2 to turn on when the video switcher selects camera 2 and mute channels 1, 3, and 4. Each tally input requires a discrete connection at the GP 132.

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